



**Controlled Environment
Agriculture (CEA)**

CASE STUDY



Controlled Environment Agriculture (CEA)

The efficient, sustainable and environmentally-robust production of plants, their products and food, which maximises yield, within:

- indoor facilities
- growth chambers
- climate-regulated systems

SA CHALLENGES ADDRESSED BY CEA

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Climate (in)action and emissions target mismatch: South Africa's current climate targets and policies have been rated overall as "insufficient" to meet with the Paris Agreement's 1.5°C temperature increase limit.
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Soil loss outweighing soil gained: On average, South Africa loses 12.6 tons/ha/year of soil which is greater than the rate of natural soil formation of less than 5 tons/ha/year.
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Production losses due to pests and diseases: Over 3 500 farms in South Africa experienced losses in production due to pests and diseases of which the majority were due to vermin and other predators and the minority due to other pests/diseases.
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Water stress and insecurity/scarcity: SA is the 30th driest country in the world, placing considerable pressure on the water intensive agricultural sector.

ASSOCIATED CLEAN TECHNOLOGIES

NFT Hydro manufactures **hydroponic commercial and semi-commercial grower systems** growing a variety of fresh produce crops.

OTHER EXAMPLES OF CEA SUPPLIERS

Ichthys Aquaponics and Future Farms.

KEY DRIVERS FOR THE UPTAKE OF CEA



Rapidly increasing rates of urbanization: By 2050, 68% of the world's population will live in urban areas. However, in South Africa, 80% of its total population will be urbanized, outpacing the global average trend.



Current levels of food insecurity and inaccessibility: 59% of people living in urban areas and 41% of people in rural areas have severely inadequate access to food requiring a food production systems overhaul.



Climate change, variability and vulnerability: Prolonged droughts, increased frequency in extreme weather conditions, and shifts in rainfall distribution patterns create unpredictable growing conditions and the need for alternative, innovative, sustainable agricultural production methods.



Shift to best practice environmental land use management: A 1.5°C pathway requires less fertiliser use and shorter food transportation journeys.



Conscious consumerism and shifting preferences: Consumers are changing their buying habits towards more sustainably produced food items that are eco-friendly. Demand for food grown locally in cities, reducing food mileage and prolonging the shelf life of produce - termed *locavorism*.



Water scarcity: SA is the 30th driest country in the world and the water crisis together with social instability were ranked as the 3rd highest risk for doing business in SA.

KEY BENEFITS OF CEA

- **All-year and season round food production:** Controlled, regulated climates, temperature, humidity, CO2 and airflow can mimic desired conditions for optimal food growth despite external weather conditions.
- **Multiple cultivation methods and formats:** Variety of advanced food cultivation methods through hydroponics, aeroponics, aquaponics, and soil cultivation either in greenhouses or containerized solutions.
- **Growing more food with less space where it's needed:** Vertical farming methods in greenhouses/containerized solutions increase crop-production density for greater yields and can be situated close to urban centres with less time, costs and carbon footprints involved to transport the food.
- **Pest-control and better quality:** Controlled, indoor environments can enable precise growing conditions and prevent pests from destroying crops which can produce better quality food, and less conditions for wastage.
- **Job creation, as the demand for fresh produce increases.**

UNDP'S SUSTAINABLE DEVELOPMENT GOALS (SDGS)



2 Zero hunger



9 Industry, Innovation and Infrastructure

What will it take to shift the dial on CEA?

- **CEA requires considerable capital investment to unlock market potential:** It is estimated that by 2026, the global CEA market will be worth USD 1,58 mil. In SA, the CEA market is valued at R28 million (for low-tech CEA) to R600 mil. (high-tech CEA), with growth predicted at 15% a year. To unlock these benefits, access to affordable and viable financing solutions will help more projects get off the ground and buffer the considerable upfront and high operating capital cost requirements.
- **Dedicated resources for R&D, skills, and training for CEA:** Not only can CEA yield nutritious, affordable food, but the industry can create new critical skill-sets and provide job opportunities to individuals within urban-centred (or location specific) regions. Dedicated support and funding towards R&D and CEA-suited training can help steer the industry towards a profitable direction by developing the skilled workforce it needs.

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