Energy Efficiency and Autonomous Technology in Urban Farming

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OUR COMPANY

Arianetech specializes in the research & development, manufacturing of modern agricultural technology and equipment. With our own unique advanced technology, we are able to provide total agricultural solutions for urban farm growers.

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OUR VISION

Creating opportunity and growing the future for sustainable urban farming

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The Urban Farming Revolution

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Fundamental Shift in Food Production

- Urban farming's emergence in cities
- Departure from traditional rural landscapes

Fresh, Local Produce with Minimal Carbon Footprint

- Reduced need for long-distance food transportation
- Locally grown, minimizing environmental impact

Resilience to Erratic Weather Patterns

- Consistent crop supply despite weather fluctuations
- Stable food production amidst unpredictable conditions

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In 2015, I was tasked with establishing Singapore's first indoor vertical farm. Situated within a repurposed factory space and illuminated by LED lights, this farm produced over 80 tons of leafy greens annually within just 700 square meters. Employing minimal water and avoiding pesticides, it marked a novel approach for us.

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While the farm yielded exceptional produce, unfortunately, it never turned profitable and eventually closed after six years.

Cause:

Energy needed to power light

Rising Energy costs

Downfall

02

Learning from Urban Farm Closures

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Key reasons for struggles with mounting debts

01 High energy costs stemming from inefficient production equipment have weighed down these farms.

Poor Energy Efficiency

02 The high cost of living in urban areas has made it expensive to recruit and retain workers.

Labor Costs

03 High production costs forced these farms to sell their produce at elevated prices, and some struggled to secure contracts due to market resistance against pricier vegetables. Consumer are unable to identify the benefits of buying urban farm produce and are unwilling to pay a premium for it.

Consumer Behavior

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Energy Efficiency: The Cornerstone of Sustainable Urban Agriculture

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LED Technology

- ✓ **Made significant strides in the last decade**
- ✓ **PPE has increased nearly fourfold**
- ✓ **Secondary optics implementation in LED design**
- ✓ **Customizable specific monochromatic color spectrums to minimize energy wastage**
- ✓ **Customizing the intensity & operation duration controls various aspects of plant growth such as shape, color, taste & aroma**

In recent indoor vertical farm . . .

3kWh

Lighting energy to produce
1 kg of lettuce

- ✓ **Significantly lowers air conditioning load**
- ✓ **Reduce operational costs by integrating Photovoltaic Panels on roof**
- ✓ **Enhance farms' resilience**
- ✓ **Nearly net-zero carbon footprint**

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The Rise of Autonomous Technology in Urban Farming

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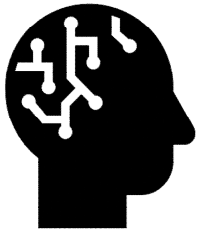

- **Planting, Transporting and Harvesting crops**

- **Precision & Efficiency**

- **Work alongside AI-driven drones to monitor crop health continuously**

- ✓ **Continuous & efficient production cycle without succumbing to fatigue**
- ✓ **Reducing human presence lowers risk of pest or pathogen**
- ✓ **Resource Management of water & energy**

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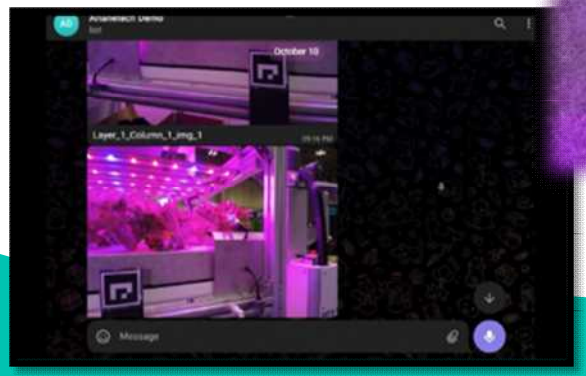

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Environmental Impact & Sustainability

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- By reducing the energy footprint and utilizing resources effectively, urban farms can mitigate the environmental impact of agriculture.

- They combat global warming, preserve the livelihoods of farmers, and protect our water sources from contamination by avoiding the use of harmful pesticides and fungicides.

- Urban farming also drastically cuts greenhouse gas emissions associated with long-distance food transportation, as these farms are typically located near consumers.

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Conclusion & Call to Action

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Conclusions

Energy efficiency and autonomous technology are igniting a revolution in urban farming. They are enabling us to create sustainable, resilient, and self-reliant food systems within our cities.

Although some of these technologies are still work in progress but we are already seeing a future where these technologies can change the way urban farm operate that will be both environmentally and financially sustainable.

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Thanks!

Contact us Today!

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