

# HYDROPONICS

## An Agricultural Resurgence

### Background

California continues to struggle against prolonged water shortages. Entering our fourth year of severe drought, projections of future water availability are getting bleaker. Despite fading prospects of a better tomorrow, California can experience an agriculture-related economic resurgence, one that improves the economy, enhances the environment, and improves quality of life for all.



Credit: Emirates Hydroponics Farm

### Hydroponics

To create a future where California can increase food growth without significant amounts of water, establishing vertical hydroponics systems would achieve this future. Depending on the configuration, most hydroponics systems can reduce water consumption by more than 50%, with up to 95% being achieved through aeroponics. One of several hydroponics-based growing techniques, aeroponics allows for plants to grow without a growing medium. They are fed by an enriched mist that's sprayed directly onto the roots. This setup has the highest water efficiency of the hydroponics-based growing techniques. Improved growth efficiencies, eliminating the need for pesticide/herbicide use, nutrient delivery control, and the removal of stress via weather extremities are just some of the many advantages indoor hydroponics has over traditional farming methods.

### Construction

This proposal would result in a steady building of new facilities to accommodate hydroponics-based operations, resulting in long-term construction jobs. Air quality would also improve by reducing dust picked up by wind, and removing the need to spray pesticides & herbicides.

### Solar Energy

While LED's provide high levels of efficiency, it would be cost-effective to utilize solar panels in conjunction with hydroponics-based operations, thereby saving on utility costs long-term. With solar panels continuing to become more affordable, this would lead to additional growth in the solar installation & technician industry, an important jobs sector for California.



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## Manufacturing

Indoor hydroponics requires a variety of manufactured components: LED's, support apparatuses, water pumps and more. A more than \$500 million industry, the hydroponics industry is projected to have a compounded annual growth of 6.5% through 2018.



Credit: Mirai

## Next Steps

Several steps that can be taken to ensure California's food-generating regions emerge from the drought as prosperous areas with a bright future.

**Access to Capital** – Enabling/assisting farmers & entrepreneurs with access to capital would be highly beneficial in jump-starting the transition from traditional farming to hydroponics.

**Presentations** – Developing presentations for farmers & entrepreneurs on why/how to establish hydroponics-based farming could be developed and presented throughout California.

**Education** – At the community college level, establishing courses/certificates in hydroponics would be ideal. For high schools & colleges, developing entrepreneurship seminars/courses, with an emphasis on hydroponics technology, would be beneficial.

**Hydroponics Institute** – Establishing an advanced hydroponics institute at the UC/CSU, with the intent of transferring new technologies to industry, would be highly-advantageous in pursuing, as it would provide a competitive advantage for California-based companies.

## Benefits

There are several benefits to be gained by pursuing the proposed course of action:

- More Jobs
- High-Quality Workforce
- Better Air Quality
- Significant Reduction of Water Use
- Expanded STEM Education
- More Federal Funding Opportunities
- Reduced Pesticide/Herbicide Use
- Improved Quality-of-Life