

Eduponics Institute USA

www.eduponics.institute

Urban Indoor Vertical Farming Concept and Business Plan

We seek to expand and diversity food sources for all people, with particular emphasis on cities. We thought we should explain why.

Who eats? Growth, obsolescence, deprivation and the urban food desert

- In the USA: the urban model since 1920 has emphasized peripheral growth due to the automobile.
- Suburbs have absorbed most new growth, and older housing has declined and decayed.
- Resulting price differentiation has led to concentration of the elderly, the poor and the very poor in central cities, and social segregation follows price and obsolescence.
- As cities becomes segregated by class and race, it becomes possible to live one's life completely within a narrow and deprived sub-population or social group.
- Geographically, this also means that the distance to commercial, educational, medical and nutritional supply points can become ever greater.
- In the case of nutrition, this can create *urban food deserts* in which only the most basic, highly processed foodstuffs are available, and the missing options turn out to be fresh, locally grown, fruits and vegetables, accompanied by a litany of malnutrition, obesity and low performance, which reinforce the social segregation that caused them.
- None of this is helped by an economic and political system focused on growth and capital accumulation. Negative stereotypes of the old, the poor and the minority are not necessary to these processes, but they do make them worse.
- Perhaps we should ask not "who eats," but "who eats well enough?" If the answer is not "nearly everyone," then we're not doing it right.

Agriculture: Traditional and future

- For 10,000 years humans have grown crops and brought them to central places to exchange them for goods and services, first for tools, clothing and shelter, now for ideas and stimulation. This worked really well for centuries, allowing most of us to prosper and expand our numbers. Few would choose to return to an earlier time.
- Much current agriculture is organized on profit models that place decision making in the hands of very few and depend on extensive techniques that can harm the environment.
- The land area of Earth is 57 sq mi or 147 sq mi total land area. Of that, 36.7 million sq km is available and suitable for agriculture¹. There will be no more forever.

Urbanization: Now and again, and again

- Depending on whose estimate one chooses, somewhere between 50% and 85% of humanity now lives in urban communities².
- Cities occupy about 3.6 million sq km (about 10%) of all land. Most cities are on former agricultural land, and most growth reduces the availability for agriculture.
- Some time in the present century, a man and woman will be born who will deliver the ten-billionth living human. Between 85% to 95%—perhaps more—of those billions will live in cities. That's at least eight and one-half billion people, about as many as are now alive. They will be concentrated on about five percent of the earth's surface (assuming that future cities will be more like Shanghai than Los Angeles).

Conclusion: We must adopt urban vertical farming to increase food production and feed our future population. Vertical farming allows more production on less land with less environmental impact.

¹ The World Bank. <https://data.worldbank.org/indicator/AG.LND.TOTL.UR.K2>

² Our World in Data. <https://ourworldindata.org/how-urban-is-the-world>

Solutions: Inward and upward

- Considerable sums of money and effort have been invested in recent decades in urban vertical farming. A search of the Internet will return innumerable texts and videos describing indoor farms and farming techniques. Many of these are innovative and highly productive.
- They reduce water usage and use fewer (or no) chemical additives like pesticides, herbicides and petrochemical nutrients.
- They are space-efficient and often nearer to distributors and consumers.
- Do you sense a **however** in your future?
 - Although many are created with good intentions, they require vast amounts of capital and rely on major economies of scale. This means that only a few large investors can participate in global solutions. And surprise!, they are often the same corporations that have created the extensive model of the past and are committed to the survival of their existing organizations "to protect shareholder value" above all.
 - In addition to financial considerations, the corporate model depends on reducing variety and on standardization of products, which allow simpler production methods and facilitate the replacement of humans by machines. When Henry Ford famously said that customers could "have a car of any color, as long as it's black," he was not seeking to beautify America's streets but to reduce the cost of pigment. (Note: This has nothing to do with pigs, which are not currently suited to urban indoor farming.)
- Our organization is developing an alternative model of urban farming that will be more inclusive, more distributed, more community-based, more mobile, and more sustainable.

Twin Dilemmas

We perceive the urban food desert (UFD) as resulting from and reflexively causing two parallel problems. One is nutritional deficiency, and the other is economic exclusion. We refer to these as the twin dilemmas of the UFD. Just as the problems reinforce one another in a negative spiral, the solutions should do the same but positively.

Dilemma 1: Deficient Nutrition

Characterized by

- Lack of retail food outlets and lack of variety
- Distance from farm to market leading to loss of nutrients; may be urban or rural
- Reliance on low-end grocery chains and fast food shops
- High fat and sugar diets; few fresh fruits and vegetables

Potential Improvements

- Vegetables are important sources of many nutrients, including potassium, dietary fiber, folate (folic acid), vitamin A, and vitamin C. ...
- Dietary fiber from vegetables, as part of an overall healthy diet, helps reduce blood cholesterol levels.
- Fruits and veggies are naturally low in calories and high in vitamins and minerals.
- Eating plenty of fruits and veggies may help reduce the risk of many diseases, including heart disease, high blood pressure, and some cancers.

The New Dietary Regime

Goals

- Reduce obesity and disease
- Improve general nutrition
- Shrink the food desert
- Adopt healthy lifestyles

Objectives

- Grow more fruits and vegetables locally
- Expand availability: promote sales in more places
- Train families and children in health eating

Success Criteria

- More quality food sources in neighborhoods
- Greater variety of dietary options
- Shorter distance to quality vendors and products

Results!

- Local sourcing:
- Improved nutrition
- Greater dietary quality and variety

Dilemma 2: Weak Local Economy

Characterized by

- General unemployment as jobs follow population shift to new areas
- Worker dislocation or discrimination skews job opportunity
- Employers disappear as clientel moves to suburbs
- Lack of (re)training options

Potential Improvements

- New employment in food production can add jobs immediately.
- New businesses have secondary benefits over time including "export" income from goods and services, training, consulting, data processing and the use of the program as a destination training center.
- The multiplier effect as new economic activity is created can include higher incomes and business and tax revenues increase.

The New Economic Engine

Goals

- Create employment
- Shrink the food desert
- Live without pesticides, herbicides, artificial growth enhancement, etc.
- Create a replicable model for other communities with similar issues

Objectives

- Create Model Program
- Organize for Success
- Manage Operations
- Train Workers
- Build Strong Financial Support
 - Budget realistically from operations
 - Monitor budget compliance
 - Manage risk
 - Expand judiciously
 - Report accurately, transparently

Success Criteria

- Community Involved? Partners Attracted?
- Policies Transparent? Surpluses Shared?
- Listening and Learning? Open Door Management?

Results!

- Modern, urban, vertical, community based, local, efficiently operated hydroponic farming
- Resident, technically trained employees working in
 - Hydroponic farming, primary activity
 - Repair & maintenance; equipment sales, service
 - Related training
- Retention & circulation of income locally
- Home applications, non-profits, schools, housing
- Support firms supplying indoor farmers
- Retail and distribution activity related to food

Opportunity

Perhaps you're thinking, "perhaps this represents a business opportunity." Or perhaps a way for your school or non-profit organization to make a difference. You'd be right!

We invite you to discuss the prospect of starting an indoor garden of your own. Ask the person who gave you this document to connect us. We offer training, financial planning, implementation, and consulting on crops, equipment and methodology. eduponics.org

Thank you for your interest and attention.