

# **A Sustainable Environment: Our Obligation to Protect God's Gift**

by  
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## **Sometimes a “Big Hairy Audacious Goal” Leads to a Solution**

Last month, I discussed the concern of our growing population and the corresponding concern of how to feed these people. Our population is increasing by ten million people every six weeks, which means we are adding a city the size of Mexico City every three months. As the population grows, there is an increasing trend for more urban living. The percentage of people living in an urban environment continues to increase, which means people will continue to live farther from the farmland providing food. An example of a country that is truly urban is Singapore. How bad is it? If the entire world population were put into the United States, the population density would still be about one-tenth of the current population density of Singapore – or that equal to Taiwan.

Do you ever wonder how far food products have to travel to reach the dinner table of people in Singapore? Here in the United States, the average food item travels about 2,000 miles to reach an American dinner table. Just imagine the amount of energy needed to transport the food and the amount of carbon dioxide that is emitted. Is there an answer to this problem? Sometimes one needs to set a “big hairy audacious goal” to solve a problem, like manufacturing a \$100 computer for the developing nations or designing a livable house in Colorado without a heating furnace or air conditioning.

Since the beginning of man, some 10,000 or more years ago, human beings have lived in one-story houses until about 100 years ago. As more people wanted to live in cities and land became more valuable, two- and three-story buildings became very common. Now there is even a greater desire to live in cities and people are living in high rise buildings with as many as 150 stories such as the Chicago Spire designed by Santiago Calatrava. If we have gone from people living on land with food growing on land around them to people living in high rise buildings, can we grow food in high rise buildings? A “big hairy audacious goal!”

Farming indoors is not a new concept as we have been doing this for some time with hothouse production of tomatoes and other food items, but none is known to have been constructed as multi-story buildings. But what we need to do is scale up so we can feed the ongoing population explosion. We need to develop vertical farms with 40 to 60 stories and situate them in the heart of a city. The benefits of this concept are enormous. Crop production would be year-round and different crops could be grown on the various levels. There would be no weather-related crop failures due to droughts, floods or pests. All the food would be grown organically with no need for pesticides, herbicides or fertilizers. One of the biggest benefits would be the reduction in fuel use because there would be no tractors, plows or shipping of the produce. Also, there would be a much

more efficient use of water. The produce retail store could be located on the first floor selling very fresh products. A proposal for downtown Toronto consists of a 58 story vertical farm that can replace the equivalent of over 1,000 acres of traditional farming. The design includes separate floors for strawberries, eggplant, cucumbers and tomatoes, potatoes, wheat, peppers, soybeans, spinach, green beans carrots and lettuce. It can provide a balanced diet for 35,000 people year round.

What if the land in the middle of a city is too valuable for a “farm”? Perhaps one can combine a high-rise residence with a farm on the roof and higher. Or the residences can be in the upper floors. Or you can locate the vertical farm in a less valuable part of the city and still reap the benefits of being in the city. The combination of a farm and a skyscraper could be a very important change in how we provide nutrition to this growing population.

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