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Singapore: Growing Up

In the news you hear about how America is going through a recession. The gas prices are on the rise, food prices are going up, and people everywhere are being laid off of work and taking cuts in pay. The effects of these difficult times show all over the country. Some people that can afford to have simple luxuries think they have it bad because they are barely making ends meet, but there are people out there that cannot even afford enough food to feed their families. There are places in this world where parents have to choose to either feed their kids or feed themselves.

Singapore is surrounded on all sides by the water of the Singapore Strait and is also closely bordered by Malaysia. Singapore is about 272 square miles in area with a population of 5.18 million which makes it the second most densely populated independent country in the world (Demographics of Singapore). The country of Singapore is simply one giant city, where the citizens live in huge apartment buildings stacked on top of one another. They have no front yards and no back yards. If they own pets, they have to be small and containable. They can not own animals like horses, cows or goats. They sometimes are not even allowed to own dogs for lack of space.

There are many different ethnic groups in Singapore such as Malay, Chinese and Indian (Singapore Expats). Religions are all intermingled, and they include Islam, Hinduism, Christianity and others (Singapore Expats). Even though there are many ethnicities, all races and religions are still evident in everyday life in Singapore (Singapore Expats). Since Singapore has such an ethnic diversity, the country has a very wide variety of foods available. Such as Chinese, Mexican, Indian, Malay, as well as many other Asian dishes, such as Indonesian. All of these types of food can be found and are prominent in the everyday life of Singapore (Food in Singapore).

A typical family in Singapore remained relatively unchanged at a size of three to four people per family. The average family lives in a four room flat that consists of three bedrooms, bathroom, kitchen and dining area (SingStat). This could be compared to an apartment building or a hotel room. The difference is that in America a minority of our population lives in these types of buildings where as in Singapore the majority of the population lives in these types of buildings or worse. The number of households with one or more working family members has increased to 91 per cent in recent years (SingStat). The median monthly income of a Singaporean is about \$1,990, with resident that live in smaller dwellings receiving more government transfers then those in larger dwellings (SingStat). This would be like our government paying people to have smaller families.

The percent of the population that is below the line of poverty in Singapore is considered as not applicable because it is based on the income of the people. Singaporeans have a stable amount of income but they are still in crisis because they can't afford a sustainable amount of food. The price of food in Singapore is what makes Singaporeans a country in need.

In Singapore, the price of food is so high that people can barely afford to feed one person in the family and sometimes the case is that there are five people in the family. If you can only afford to feed one, then either four people do not eat or everybody gets only a very little bit. Singapore was ranked one of the ten most expensive cities in the world to live in (10 Most Expensive Cities in the World). In America the average amount of money needed to pay for only one person to eat for a month is approximately 60 dollars. While in Singapore, the average amount of money needed to pay for only one person to eat for a

month is approximately 200 dollars (10 Most Expensive Cities in the World). It takes 140 more dollars to pay for the same amount of food in Singapore than in America. Imagine if the food in America cost 140 more dollars than it does now, what kind of crisis would America be in then?

Singapore has a very important history that dates back to the 11th century, although the island of Singapore did not rise into importance until the 14th century. It was in the 14th century, under the rule of Srivijayan prince Parameswara, that Singapore became known as a port (History of Singapore). As a new and popular port city, Singapore remained important until it was destroyed in 1613. The modern history of Singapore does not begin until 1819, when a British port was established on the island. Under the British colonial rule, Singapore again grew to importance and once again became a well known major port city (History of Singapore).

Singapore was conquered and occupied by the Japanese Empire during the time of World War II, from 1942 to 1945 (History of Singapore). When the war finally came to an end, Singapore had reverted to British control, with increasing levels of self-government granted, culminating in Singapore's merger with the Federation of Malaya to form Malaysia in 1963 (History of Singapore). A dispute between Singapore's ruling People's Action Party and Malaysia's Alliance Party led to social unrest, and it eventually led to the separation of Singapore from Malaysia (History of Singapore). It was at that point on August 9th, 1965 that Singapore became an independent republic.

Once Singapore became an independent republic the country faced some tough economic troubles. Singapore was facing severe unemployment and with the country's rapidly growing population, Singapore was faced with a housing crisis. To react to these problems Singapore began a modernization program that focused on establishing a manufacturing industry, developing large public housing estates, and investing heavily on public education (History of Singapore). Since Singapore became independent their economy has grown steadily at a rate of 9% per year on average (History of Singapore). By the 1990's Singapore had become one of the world's most prosperous nations, with a highly developed free market economy, strong international trading links, and the highest per capita gross domestic product in Asia outside of Japan (History of Singapore).

Once Singapore became one of the most prosperous nations in the world they began to grow at a rapid rate (Singapore Population). With the explosion of Singapore's population what little rural land that still remained was diminished. It was overrun with people and buildings, one of the very last rural areas Singapore has left is known as Kampong Buangkok. Kampong Buangkok is about the size of three football fields and has 28 houses inside the village (A Piece of Singapore's Disappearing Past).

Now 90% of the population has been moved into government housing, and unfortunately this piece of land that shows Singapore's history of agricultural and rural heritage is about to be condemned (Singapore's Disappearing Past). The government has slated this little village for demolition and redevelopment possibly in the near future. Once this occurs and this little village is gone, one of the world's most extreme national makeovers will be complete. There will be no rural areas left in Singapore (Singapore's Disappearing Past).

Singapore country of Singapore is now one big city where just about every square inch of space is occupied by skyscrapers and roads. The little bit of rural area that remains is quickly being turned into highways, city parks, and buildings. One thing that was forgotten when the land was demolished to build more buildings is how to feed Singapore's growing population with no land to produce anything.

Since the whole country is being overtaken by big cities there is no room for farming of any sort. They have no place to grow corn, beans, wheat, vegetables, or fruits. They have no place to raise pigs, goats, cows, or chickens. Where does Singapore get their meats and produce now? They import them from other

countries. They pay other countries to ship over 96% of the food that their country consumes (Food Waste Republic). In doing this, they greatly increase the price of food for their consumers. Even though Singapore has such a problem with food security, somehow it wastes one-fifth of its food supply (Food Waste Republic). Many of the wealthy people in this country who can afford food over buy and waste it. Somehow the government fails to see these things as a problem. These problems are what keep Singapore as a nation in need. By implementing a few simple solutions into Singapore's society they could improve the prices of their food and make it more accessible.

Traditional agricultural practices take space to produce large quantities. Space that Singapore does not have. What they do have though is an entire country of apartment buildings. If each of these buildings were to have a rooftop garden then that building would be supplied with fresh foods during the harvesting times. A rooftop garden protects against temperature extremes, absorbs carbon dioxide and triples the lifespan of the roof (Installing a Rooftop garden). Rooftop gardens are very practical and end up paying for themselves in what they save in heating and cooling costs for the building and food that you didn't have to buy in the stores.

Standard green roofs hold four inches of soil and weigh 15 to 20 pounds per square foot. This is perfect for shallow rooting plants. To prepare the roof for proper drainage and waterproofing, you must add a layer of tapered insulation to channel excess water into storage tanks at the bottom of the building. This layer also protects the roof from wayward roots. The natural flow of gravity is what brings the water from sitting at the bottom of the beds to the tanks below (Home and Garden). The average rooftop garden consists of an insulation layer, a water proof membrane to protect the building from leaks, a root barrier to prevent roots from penetrating the waterproof membrane; a drainage layer, usually made of light weight gravel, clay, or plastic, a geotextial or filter mat that allows water to soak through but prevents erosion of fine soil; a growing medium, plants, and sometimes a wind blanket (Home and Garden).

Once the roof is fully protected you can put the soil down. To install one entire rooftop garden and be ready to plant only takes six days to complete. Many companies deliver soil that is lightweight and especially designed for rooftop gardens but this can get pricey, up to 20 dollars per square foot. By buying the soil in bulk and installing it yourself you can reduce this cost to about \$5.50 per square foot. Not to mention the numerous companies that partner with green projects such as these that will also greatly reduce the cost of installation. Some of the companies and organizations that are willing to partner with green projects are the Singapore Environment Council, CGS (Clean and Green Singapore), and Do-Yi Enterprise and these are only a few examples.

Singapore's government supports the idea of being a green roof nation. Singapore National parks has already introduced the Green Roof Incentive Scheme to encourage owners of existing buildings to green their roofs (Green Roofs). Under this program Singapore National Parks will pay for 50% of the installation costs, since rooftop gardens are lightweight enough to be installed in most existing buildings without the need of extensive structural retrofitting (Green Roofs). The program will also fund the continuous surface of plants on a rooftop garden.

The problem with this program is that Singapore is not fully aware of the potential it has and the benefits it carries. Education about rooftop gardens is something that is very important now. With these opportunities out there it is important that Singaporeans are aware and can take full advantage of the opportunities at hand. Advertisements, hand-outs, and programs taught through the schools are only a few ways to spread the word of this amazing concept.

With Singapore being a big city the air pollution is always a concern. If most of the buildings in Singapore had a green roof, then the air quality would be greatly increased because of all the carbon dioxide absorbing plants on every roof.

Hydroponic rooftops are rapidly becoming popular throughout urban areas. A company called Sky Vegetables has identified several target locations around the United States to build these rooftop green houses (Sky Vegetables). In Brockton, the company is installing a garden on top of an old shoe factory. This factory is 66,000 square feet and will produce an astonishing 850,000 lbs. of herbs and greens that they will distribute to local schools, hospitals, retailers, restaurants, and food banks all year round (Sky Vegetables). Systems like these will also use carbon dioxide emissions from the building as an energy source for growing the plants and will capture rainwater that taxes even big city sewer systems (Sky Vegetables).

You may be asking how these gardens will produce enough to really affect anything. The reality is that these hydroponic systems really create a large quantity of produce and could greatly impact the fight on hunger. These systems are unique because they can produce all year long. In traditional gardens plants are in the same soil all year long, while in hydroponic systems no soil is used. Naturally harvested liquid nutrients and minerals that will optimize a plants growth are put in water that passes directly over the plants roots (Sky Vegetables). This allows for a continuous all year long, compared to a soil based farm that averages only two or three crop turns a year (Sky Vegetables). Over a hundred herbs fruits and vegetables can be grown with hydroponic techniques (Sky Vegetables).

Rooftop gardens can also provide a sense of unity throughout the buildings they are on because they bring the people to a central location to gather and spend time. Gardening is also a way to relieve stress and as a community these families could tend to the gardens and share the yields. When you are involved in the producing of an object and when the final product is given to you, you are filled with a sense of accomplishment and the people of Singapore need that. They need to feel that they are taking care of themselves and making a difference in the way they live.

If Singapore were to implement these hydroponic techniques they could produce an astonishing amount of food all year round that could be given to food banks, hospitals or distributed to the needy. By implementing these techniques Singapore could greatly change their need for importing to supply their population with sustenance.

Although, rooftop gardens help solve Singapore's food productive problem, Singapore also has a problem with food waste. With over 95% of Singapore's food being imported it is unjustifiable to waste any good food. In Singapore, more than 400 kilos of food is dumped by one supermarket alone per day. A food court churns out 500 kilos of food waste a day. A typical banquet sees one third of its untouched food thrown out as well. After all this, only 12% of Singapore's food waste gets recycled. Cosmetic filtering is also a major food waste culprit. These are major problems that if fixed has the potential to feed many of the hungry mouths that Singapore harbors. Food from the Heart is an NPO that redistributes unwanted commercial food to the needy. They have many programs but two that really stand out are The Bread Distribution Program, and The Food Goodie Bag program.

These programs are centered on finding ways to save money; reduce the amount of perfectly good food going to waste, and helping families and kids in need of meals. The Food Goodie Bag Program collects sacks of food from donors and charities that they distribute to families throughout schools. By doing this they have increased attendance throughout the schools, decreased violence in the families and increased the grade average of the children in the program. The Bread Distribution Program partners with bakeries and stores to collect their unsold bread. They take this bread and have volunteers that take routes to

distribute that bread to those in need. On a monthly average this program manages to save around 23,000kg of bread from the garbage bin.

With programs like these out there, there is no reason why food should be wasted in such a manner as it is now. It should go farther than just shops and volunteers. This should be a real business where people are dedicated to reducing waste and feeding the hungry. They should not only partner with bakeries but with big city malls with food courts and businesses that throw away food. This could go so much farther and save so much food from being wasted. With the drastic amount of food that Singapore is importing and the prices of this food, this program could really make a huge impact.

These days it is really important to think about how you are affecting the earth whenever you make important decisions. People usually overlook the consequences of their actions and how those will affect the environment. These solutions are all earth friendly and stick to the go green method. Having a community garden will reduce the waste of food in the markets and it will improve the diets of the people by providing them with a supply of healthy food for a cheap price. By using the programs that Food for the Heart use we will also help the hungry citizens of Singapore while reducing the amount of unnecessary waste in markets and elsewhere.

These methods are what Singapore needs to change what has been going drastically wrong. By growing plants on the roofs of buildings hydroponically you can feed a large amount of people all year round and have more to donate. While also improving the building quality and reducing heating and cooling costs. By conserving the food that Singapore already has and introducing programs that will ensure that the food will not go to waste you will again feed many people and reduce waste. All these methods are green and help the environment and will improve the quality of living within the city. I believe that if Singapore implements these practices they will find that they will cut the amount they import in half and have a better quality of living within their nation.

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