

‘Strategies to ensure food supply meets demand are unlikely to be sustainable’ Discuss

1. Introduction

1.1 Focus

Food security exists when all people at all times have physical and economic access to safe, sufficient and nutritious food that meets dietary needs and preference, allowing them to lead a healthy and active life (FAO World Food Summit 1996). Currently around the world there is enough food to feed its 7 billion inhabitants but an estimated of 850 million go hungry.

According to the Maplecrofts Food Security Index, 75% of the world is experience extreme or high risk of food security. Hunger kills more people every year than AIDs, tuberculosis and malaria combined.

For decades key players have been implementing different strategies to increase food supply to meet rising demand, however the issue of whether they are sustainable is being becoming common.

1.2 Definitions

Sustainability is development that meets the need of today without damaging the ability for future generations to meet their own needs (Brundtland 1987)

Figure 1 shows the 3 main pillars of sustainability; which need to be considered to ensure development, or in this case strategies for food supplies are sustainable. Economically they need to be viable; they need to consider social issues and human health and need to sustain the health of the environment.

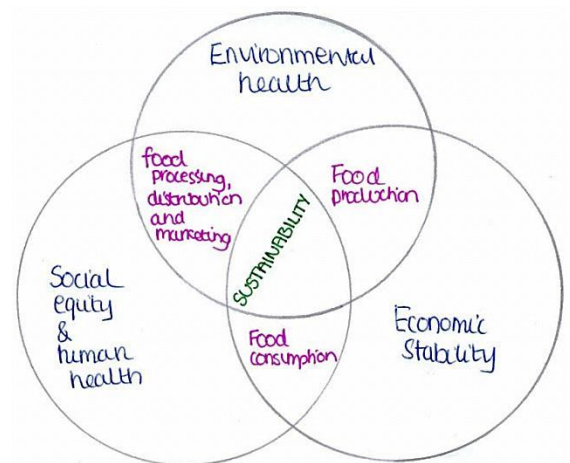


Figure 1
Michael Witherick

1.3 Framework

In this report I will be discussing different strategies, which increase food supplies at different scales and location. I will be evaluating them using Michael Witherick's Sustainability vent diagram, to assess whether strategies to ensure food supply can be sustainable. I have gathered a range of case studies, which will aid my discussion. Table below shows the case-studies that will be used.

Scale	Case-study	Location
Global	Green Revolution	Worldwide
Global	Aquaculture	Worldwide
National	Organic Farming	Cuba
Local	Appropriate Technology	Sub-Saharan Africa
Local	Great Green Wall of China	China

2. Methodology

Throughout my research I have gained information from a range of sources, including textbooks, governmental websites and newspaper articles.

Type of Source	Example	Evaluation of source	Where used
Text Books	A2 Geography Text Book, Cameron Dunn Food & Famine, Michael Witherick	Reliable source for case studies and basic theory. Has been used throughout research. Written by experienced teachers, who may pose a political bias, however as peer reviewed it reduces biasness.	Green Revolution Organoponico Aquaculture Sustainability Diagram
Websites	Governmental websites e.g. UN, FAO	Good sources for up-to-date information about food security and issues. Reliable as they carry out research for inter-governmental organisation, although they have more of a development bias.	Organoponico Statistics
Websites	NGOs e.g. Kickstart.org	First hand examples and case-studies on strategies for food supply on a local level. Reliable as they have first-hand experience, however as they run public funding they may over advertise the truth. Therefore progress is cross-referenced	Money Maker Pumps Statistics
Newspaper	Guardian	Excellent source to gain up-to-date and relevant articles of food supplies around the world. Have dedicated area for food security, which shows they have an interest. Writers however may take a particular stance on an article. There is however bias as Guardian has a strong environmental and left-wind political views point.	Aquaculture Green Revolution Great Green Wall of China

3. Analysis

3.1 Global Strategies

3.1.1 Green Revolution

The Green Revolution occurred between 1960 and late 1970s and was a series of research, mechanization and introduction of high yield varieties, that aided to increase yield around the world. During the time across the world many nations were experiencing famine and food shortages e.g. South Asia, the initiative aim was to eradicate this.

Traditional farming was scrapped and machinery was introduced. Chemical input, such as fertilizers, pesticides and herbicides were also used to increase yield. Hybrid seeds were developed (rice and wheat) to resist physical growing conditions e.g. high winds. Training was also given to farmers to ensure they bridge the gap between traditional farming and intensified farming that meet the needs of the people.

The main benefits were that overall crop production increased dramatically, for example India increased their yields by 60%. Economies developed as the idea of monoculture and trade became popular. Many countries, such as Mexico became self-sufficient and are now the biggest exporters of staple goods, such as wheat. Overall food supplies increased and widespread hunger and famine was eradicated.

However the costs of this strategy were fatal. The use of chemicals in food production had damaged ecosystems and extinct biodiversity. Depletion of water sources, due to the fact that it requires intense irrigation and pollution from chemical input (nitrates and phosphates) have led to water insecurity. Experts such as Vandana Shiva believe that it has caused more negative impacts than benefits.

Sub-conclusion: Is it sustainable?

Overall the Green Revolution increased food supplies, however environmentally it has been damaging, socially it has also led to collapse in livelihoods, as farmers are dependent of global markets, which allows little room for development, leaving them in poverty and economically it has been expensive, as machinery, chemicals and hybrid seeds are costly. Therefore it has not been sustainable.

3.1.2 Aquaculture

Aquaculture is the rearing and cultivation of animals and plants within water condition. In the last 30 years aquaculture, such as fish farming has become popular, China is currently the largest producer, producing an estimated of 60% of world's farmed fish. One of the main reasons for this is that globalisation has transferred different cuisine around the world. It is believed that aquaculture is one of strategies that have the ability to contribute highly to global food supplies.

The benefits of aquaculture are that it helps to replenish wild life stock of fish. Fish farming can also be managed and designed to meet the needs of people e.g. rearing a particular type of fish. For example in northern Thailand training centres have been opened train people how to effectively set up fish farms and cultivate aquatic plants for food. This has helped to improved food supply and the nutrition of people.

However there are limitations associated with aquaculture. Aquaculture farms need to be well managed; otherwise they can have a negative impact. As non-native species are farmed, the farms need to be well built and managed, other they can be released into environment, threatening the survival of native ones, e.g. in Fiji poorly built ones are endangering native endemic species. Fish farms in particular also spread diseases, if not adequately treated, according to the FAO; the industry spends \$3 billion to solve the issues of diseases.

Sub-conclusion: Is it sustainable?

Aquaculture can be sustainable strategies, if well implemented and managed. Socially it can contribute highly to increased food supplies and food security, due its high nutritional value. Economically it can improve incomes for people e.g. in Thailand, farmers are valorised fish farming into other commodities. Furthermore environmentally the strategy could be damaging e.g. invasion of alien species.

3.2 National Strategies

3.2.1 Organic Farming

After the collapse of the USSR in the 1990s, Cuba trade fell by 80% within its first year. Cuba was heavily dependent on the USSR for cheap food imports and petrochemical fertilizer for food production. The collapse led to widespread hunger across Cuba, where average would consume under 1800 calories per day (FAO).

Cuba and its key players e.g. national governments and local people came with a strategy to introduce organic and urban farming to meet the demands of its population, that has grown double in size. They government converted export land into food production, encouraged urban-rural migration for farming and increased urban farming; through the implementation of roof top gardens. The concept of organic farming consisted of soil conservation, worm composting, bio pesticides, fertilizers and herbicides and crop rotation to increase food production and supply. By the late 1990s increased food supply helped to decrease hunger. The nutritional consumption of food increased to an average of 2,600 calories per day (FAO).

The benefits of the strategy were that food production increased dramatically to meet the rising demands for its population, through little use of chemicals, this therefore preserves the environment and ensures a sustainable future. A large proportion of the population also became employed, this improved incomes for people.

Sub-conclusion: Is it sustainable?

Yes the Organic revolution in Cuba was sustainable. Using figure 1, it was environmentally friendly, due to little chemical input and low food miles, socially it also increased jobs and food security and economically Cuba currently exports its farming technology.

3.3 Local Strategies

3.3.1 Great Green Wall of China

The Great Green Wall of China is an attempt to build a 3,500 km² forest across the northern regions of China, to mitigate the effects of desertification from the Gobi Desert. Desertification is one of the greatest to food supply and security. In northern China an average of \$50 billion of food is damaged due to the effect of desertification causing crop damage, soil erosion and dust storms. The afforestation scheme will help to secure future food supply, by rehabilitating degraded land and stop further erosion.

The benefits of the scheme are that it will ensure food supply, especially as demand is rising due to increasing population in China. It also helps towards mitigating the effect of climate change.

However the costs are that the project is a long-term strategy, therefore it will not provide food supply immediately. Furthermore it also caused farmers to lose proportion of their farm land, leading to reduced space for crops.

Sub-conclusion: Is it sustainable?

Environmentally the strategy is sustainable as it protects the environment and also provides a sustainable source for timber. However socially some farmers have lost part of their land and economically it is expensive, costing up to \$8 billion.

3.3.2 Money Maker Pumps

The Kickstart NGO currently works across sub-Saharan Africa, in countries such as Burkina Faso, Tanzania and Kenya, to help small poor hold farmers to get out of poverty quickly, sustainably and cost effectively.

Currently they provide appropriate irrigation tools, such as the Money Maker Pump, that helps farms to easily and quickly irrigate their crops. The pump works by pouring water into a funnel, pumping it and holding the spray.

The benefits of the project have been that small hold farmers have been able to increase their crop yield, this has allowed them to create small business (Kickstart has created 120,000), where they sell their surplus crops to local markets, which helps to increase food supplies on a local level.

Sub-conclusion: Is it sustainable?

The small-scale solution is sustainable as it environmentally helps to conserve water, as it stops farmers carrying out unsustainable irrigation methods e.g. flood irrigation, where instead they 'target irrigate' crops. Socially it has also helped to bring 780,000 people out of poverty, by improving incomes and allowing families send children to school, contributing to better quality of life. Economically the Money Maker Pump is affordable and easy to maintain.

4. Conclusion

Different strategies have been implemented on different scales, including global and local to increase food supply and ensure food security for all. As assessed in the analysis different strategies have various degrees of increasing food supply and sustainability. Some may increase food supply drastically, due to major changes in farming e.g. Green Revolution, whereas others increase supply at smaller local scale e.g. appropriate technologies. Furthermore all have various degrees of sustainability some are more overall more sustainable than others, as they consider the three factors social, economic and environmental.

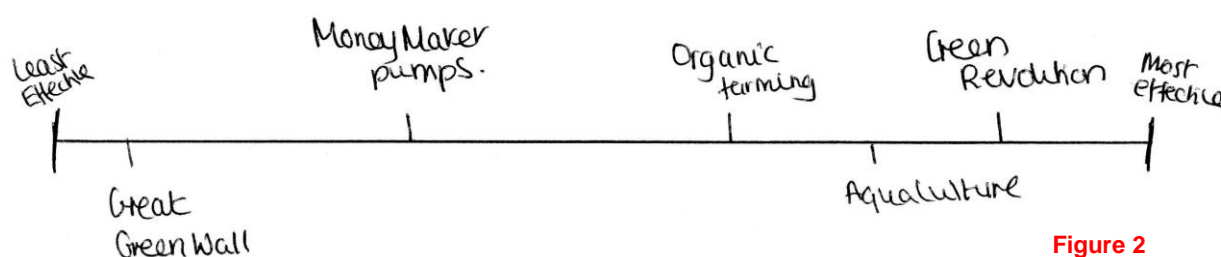


Figure 2

Figure 2 shows the strategies ranked by their effectiveness in increasing food supplies. It is clearly seen that global strategies are more successful in increasing food supplies, rather than local strategies, although organic farming such as in Cuba, has been very successful. The reason for the difference in effectiveness of increasing food supplies between global and local is that global strategies have more funding, expertise and knowledge available to implement strategies, whereas at a local scale such as the Money Maker Pumps, NGOs rely on public funding. However there are strategies such as the Great Green Wall of China that are funded by the government, that could potentially increase food supplies but the outcome is still yet to be seen.

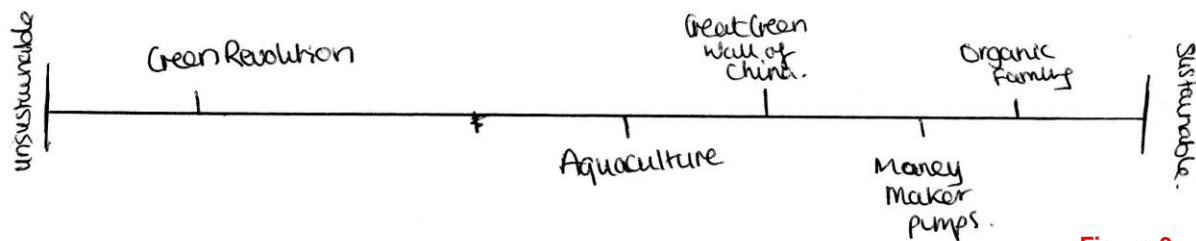


Figure 3

However figure 3, shows the degree of sustainability of each strategy. As assessed in the analysis, it is clearly seen that global strategies are unsustainable than local and national strategies. The reason to explain this trend is because global strategies tend to focus only on the main problem, which in this case is increasing food supply, whereas local and national strategies are bottom up, they work with local people to meet their needs, which therefore helps to meet the economic and environmental aspects of sustainability. Another reason for this disparity is also that the players involved in the strategy have somewhat different views. The Green Revolution was led by researchers and farmers and the time environmental conservation was not a main aim, whereas Cuba and or the Kickstart NGO have established that environmental sustainability plays a role in ensuring food supply and security.

Furthermore, although global strategies are not sustainable as they can cause serious environmental damage, including loss of biodiversity, those that are well planned and managed can have minimum environmental, social and economic impact. Aquaculture in Thailand is an example where although Aquaculture is seen to not be sustainable, well managed fish farms can increase food supplies. Therefore to conclude global strategies tend to be less sustainable than national and local strategies, however as demand for food rises rapidly, food strategies need to operate sustainably at all scales to ensure food supply and security for today and in the future.

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