Edexcel GCE Geography 2008
Unit 4 Geographical Research: exemplar responses

- This is an exemplar response from the **June 2013** examination series.
- It is an example of candidate work which has been word processed and adapted to make it more suitable as a teaching and learning aid.
- Errors, including QWC errors, have in most cases been kept. The aim of these exemplar reports is to highlight good practice and areas of potential improvement. The marking levels and examiners comments given are indicative and should be used as a basis for discussion in the classroom, rather than indicating a specific grade.
- Comments and indicative marks are provided at the end of the exemplar.

Pre-release research focus:

OPTION 3: Life on the Margins – the Food Supply Problem
- Explore a range of initiatives which have had varying effectiveness in increasing food security.
- Research the differing food security strategies adopted in contrasting locations.

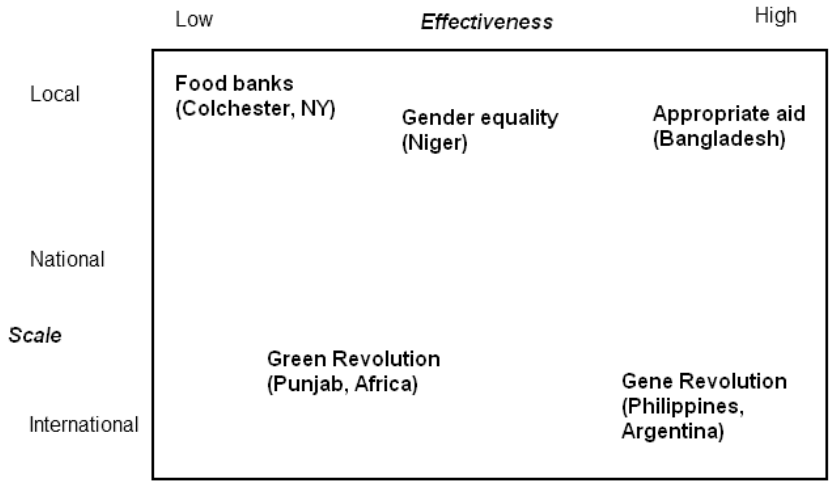
Report Title:

OPTION 3: Life on the Margins – the Food Supply Problem
3 'Strategies that attempt to increase food security vary in their effectiveness.' Discuss.
(Total for Question 3 = 70 marks)

Introduction:
As the world population continues to grow at a rapid rate, the need for a range of effective strategies aimed at increasingly food security rises. Food security is *"when all people at all times have physical and economic access to enough safe, sufficient and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle*." (WHO definition) Strategies, in order to achieve their maximum effectiveness, must be chosen to fit the particular needs of an area. It is also important to recognise that food security is changeable. It may be small and transitory in some areas but larger in scale and longer-lived in others. Therefore successful strategies are unlikely to be 'one size fits all' and able to apply to all locations.

Figure 1 shows a range of different strategies which will be considered in this export, and how each strategy varies both in terms of scale and effectiveness. Figure 1 also shows strategies applied to countries at different levels of development. Although food insecurity is more common in developing countries it can and does occur in developed ones. This report will consider examples from across the development spectrum to see if some are better than others. This again emphasises the point that strategies need to be tailored to specific situations to succeed.

Figure 1 Diagram showing strategies ranging in effectiveness and scale



This report will argue that although small scale initiatives such as promoting gender equality and appropriate aid may increase food security on a local scale they are often less successful at improving food production overall. This means that it can sometimes be appropriate to apply larger scale strategies which are designed to increase food production over a wide area. However, due to the expense and level of technology while large scale schemes can increase security in some areas they are ineffective in others.

Methodology
In preparation for the writing of this report research was carried out on a range of case studies and opinions. This was done to develop a broad sample of strategies and options and ensure that different perspectives on the issue of food security were represented. This included

researching case studies in both the developed and developing world. However some sources of information are more reliable than others and some suffer from bias:

Source	Examples	Comment
Textbooks	Food and Famine, Witherick, 2010 Edexcel A2 geography, Digby et al, 2009	Reliable sources written by teachers and examiners with extensive knowledge of the subject, but may give a restricted view.
Internet	www.bbc.co.uk/news www.practicalaction.org	Some stories may be exaggerated to entice readers, however stories are typically well researched and up to data and provide factual detail which can be cross-checked
Articles	Essex County Standard, 2012 Los Angeles Times, Weiss, 2012	Typically accurate and reliable journalistic sources, but may be politically bias
Blogs	www.foe.co.uk	Gives a wide range of opinions and viewpoints however may be bias and the views lack evidence in some cases
Visual materials	Future of Food, BBC, 2009 TVEAP films Youtube	Represent a range of opinions.

Achieving Gender Equality

Although improving gender quality may not directly increase food security, it can be seen as essential to improving food production and security. This is supported by the FAO "there would be no food security without rural women" (Food and Famine, Witherwick, 2010). The importance of women is further emphasised by the fact that in Sub-Saharan Africa it is estimated that 80-90% of food production depends on women so improving opportunities for women farmers could help increase food security. A strategy addressing this issue can be seen in Niger, supported by NGO Rural Development. Destitute women were supported to use water conservation strategies) to reclaim 2000 hectares of degraded land using tassa pits. After than land was made fertile and desertification ended, the land was shared out among women who then became more food secure as 40 fruit trees and 60 baskets of millet could be produced on each plot of land.

Despite the success of this project in Niger which shows the essential role of women in increasing food production, the effectiveness of the strategy can be questioned. High rates of female illiteracy in Sub-Saharan Africa mean that spreading the word on how simple technologies can reclaim land and increase food production is a slow process. Two-thirds of the world's illiterate people are women. If wider gender quality was promoted, for instance and increase in education for girls (a key MDG goal) it would be more likely that food production and land management strategies could be made more widely known. Also, a weakness of this type of approach is that it is small scale, relies on the funding and effort of an NGO and often

only helps 'one village at a time'. Meanwhile populations continue to grow and threats such as desertification spread. This is why many people rely on aid, especially during a drought or when an event like conflict interrupts normal food production and supply.

Making aid appropriate

Aid comes in several forms, all ranging in effectiveness. Food aid is often provided in times on famine, for instance during the 1984-85 Ethiopian famine or in the aftermath of the 2010 Haiti Earthquake. During these emergency situations it can prove effective as people need to be kept alive during the immediate threat. However, giving aid in the form of food during 'normal' times can lead to serious problems that do nothing to solve food insecurity. It can lead to dependency as well as leading to the breakdown of local food markets as the food aid undercuts the normal local trade in food.

Usually, aid is much more appropriate when it takes the form of technical assistance to increase food production directly or improve water supply of education levels. NGOs such as Practical Action focus on aid in the form of intermediate technology solutions which can be easily taught to local people so that the strategy becomes bottom-up as local people can teach other local people. In Bangladesh, small-scale farmers were taught aquaponics by NGO Practical Action where fish were farmed in paddy fields to increase food supply as well as providing natural fertilizers, circulating oxygen and reducing pests. This rice-fish culture increased yields by 70% (www.practcialaction.org) and fish provided an additional source of protein increasing food security further. However, like gender equality these strategies are small scale and rely on intermediate technology thus they take along time to implement on a large scale.

So far, all of the strategies considered have been from the developing world but in some part of the developed world food insecurity is an increasing issue.

Food banks

Very few people in the developed world produce their own food or have the ability to do so even if they wanted to. Instead, they rely on income to buy food. A surge in food banks has been seen since the 2008 banking crisis and the following recession in developed countries. This illustrates how food insecurity can be an issue in developed countries too. In the UK, the number of food banks has risen to 280 (Essex County Standard, 2012) while in New York 4.8 million households used food banks in 2009 compared to 3.9 million in 2007 (Washington Post, 2009).

However, the effectiveness of food banks in increasing food security is questionable. Although they can play a vital role in alleviating short-term hunger for the desperately hungry they do not provide a permanent solution for low income people who lack sufficient food. In a similar way to providing people with food aid in the developing world, food banks risk creating dependency. They do show the need for more effective long-term solutions to the problem of food insecurity in the developed world – a problem which is relatively small and so is often ignored.

The Gene Revolution

The gene revolution, and genetically modified crops, is surrounded by controversy in terms of the science and its effectiveness as a food security strategy. Some argue that it is the only way with the potential to significantly increase global food security by modifying the DNA of crops to add desirable genes such as drought resistance and resistance to crop pests. Others argue that GM crops are potentially dangerous in terms of their effects on both humans and the environment as their long-term impacts are unknown. GM technology tends to polarise opinion.

GM may be able to increase the nutritional aspects of good security through strategies such as Golden Rice. It has been estimated by UNICEF that in countries where rice is a stable food such as Thailand and the Philippines, deaths from vitamin deficiencies are surprisingly common (Edexcel A2 textbook, Digby et all, 2009). GM rice has the potential to be a cost effective way of increasingly vitamin A intake and reducing these deaths. Golden Rice is a form of GM rice which has been modified to increase its vitamin A level. On the other hand, the level of vitamin A in Golden Rice means that a child would need to eat 5kg per day to reach their recommended intake. In addition, Golden Rice does not produce more food it just produces food which might deal with one micro-nutrient deficiency and therefore its potential to reduce food insecurity might be very limited.

The problems of GM are further epitomised by Argentina and its drive to increase the production of GM soya beans. As a result of a huge expansion in GM soya social polarization has occurred. This has been caused by the fact that GM soya requires high inputs (machines and farm chemicals) and the seeds cost up to 3 times the amount of normal seeds (New Internationalist, 2008). As a result larger farmers have benefited because they could afford to invest in GM. Smaller farmers have been bought-out be large ones resulting in a reduction in farms of about 50,000 since the late 1990s. Many smaller farmers are now landless farm workers on low wages with increased food insecurity. Soya is also not a food crop as most is exported out of Argentina as cattle feed, so the move towards GM soya has not increased local food supply. Overall, GM crops appear to do little to increase food security although they may have potential in the future.

<u>The Green Revolution</u>

The green revolution is the selective breeding of crops to produce High Yielding Varieties (HYVs) but unlike GM it does not involve altering the DNA of crops. It began in the 1960s as an attempt to produce high yielding varieties of crops like maize, wheat and rice. Globally, it has been the most successful way of increasing food supply in the developing world and increasing food security.

Green Revolution rice in the Punjab region of India has increased yields x2 or even x4, and in some places HYVs allow two crops per year. (The Ecologist, 1999). However, this apparent effectiveness is reduced by the implications HYVs have for the environment. The huge amount of irrigation required means that water tables in Punjab are falling by up to 1m per year as groundwater is over-pumped. There are also issues of eutrophication from fertilizer use. Farmers in India has resorted to digging ever deeper wells. HYVs need very high inputs of water, fertilizers and pesticides as well as machine planting and harvesting. The result of the green

revolution has been dramatically higher crop yields for some farmers, but also social polarisation similar to that seen with GM crops in Argentina. In this way there are similarities between GM and HYV crops in that production has increased in both cases but food security has not increased for everyone.

The green revolution has also largely bypassed Africa which is the area most in need of solutions to increase food security. This is because crops such as wheat, maize and rice are not grown by poorer farmers in Africa and traditional crops like millet and sorghum have never been developed for HYVs varieties. The perfect growing conditions are difficult to reproduce in Africa. Where this has been done, maize yields have increased from 1.15 tonnes per hectare to 3 tonnes but this is not widespread enough in Africa to make a difference. The charity AGRA (A Green Revolution for Africa) is currently working to develop African farming.

Conclusion

All the initiatives discussed vary in terms of their scale and effectiveness. Because food insecurity exists in both the developed and developing world, in urban areas and in rural areas and in areas with very different climates and environments there needs to be a range of strategies designed to combat the particular problem in a location. This report has shown that all solutions have advantages and disadvantages.

It can be argued that the disadvantages increase with the scale of the initiative as is the case with the new global technology of GM crops. This perhaps shows that large scale magic-bullet initiatives should be viewed with caution as they often have unforeseen consequences such as social polarisation. They might increase food supply, but food security for some people actually worsens as small farmers cannot compete with the economies of scale of large farmers. The FOE has stated that “GM crops are confined to a handful of countries with highly developed agriculture” which perhaps suggests they are not the solution in the area of most need, Sub-Saharan Africa. GM and green revolution crops might yet help Africa but have had little impact so far.

Smaller scale initiatives such as intermediate technology aid and improving gender equality can be seen as very effective but small scale. It is possible that these strategies cannot be deployed globally because they need to be adapted to suit local circumstances and this means their effect is slow. Nevertheless, they are the bets way to increase food security as they tend not to have the negative side-effects of large scale initiatives. Any strategy that risks increasing dependency, like food banks or food aid to the developing world is the least effective because they do nothing to increase food production or income so cannot be a long-term solution. Nevertheless, at certain times, they are essential to alleviate short-term hunger.

In conclusion, initiatives need to be chosen with careful consideration of the needs of local people and be appropriate to the level of development of the area in order to ensure maximum effectiveness.

Comments

Mark scheme section	Strengths	Areas for improvement	Mark scheme level
Introducing, defining and focusing on the question (10)	• Good definitions using sources • Sets out a structure / framework and the range of material to be considered • The argument / direction is outlined	• A plan could have been included • Touch more background on the scale of the food insecurity issue	9-10 marks (Level 4)
Researching and methodology (15)	• Range of sources with valid comments on their usefulness • Choice of examples / case studies relevant and wide ranging • Accurate material	• Method table perhaps a little brief • Concepts / theories could have been included a little more	12-15 marks (Level 4)
Analysis, application and understanding (20)	• Some links made between sections • Strongly linked to the question • Covers a spectrum of development and strategies • Argues the case effectively	• Case study detail is good but conceptual links could be stronger	17-20 marks (Level 4)
Conclusions and evaluation (15)	• Very strong ongoing evaluation and evaluative style • Good recall • Cogent conclusion recognising complexity i.e. no simple answer	• Could have returned more specifically to some examples in the conclusion	12-15 marks (Level 4)
QWC (10)	• Good terminology • Logical structure and sequencing • Sources stated in main body of the text throughout	• Might have considered further diagram use	9-10 marks (Level 4)