

Why Worry About Food?

Some Ideas for Action produced by David Atkinson, Scottish Episcopal Church, for Eco-Congregation Scotland

Summary

- The huge scale of global food production means that it is our largest land based activity, a significant contributor to the release of greenhouse gases and thus to global climate change.
- Using land for food production changes the environment, especially soil condition, soil life, water use, and biodiversity.
- These are all affected by the amount of food which is needed, and the methods used to produce it in different parts of the globe. Can we feed the world now and in the future? Is the solution increased production or is it more complex than that?
- Who controls food? Production, processing distribution and retailing is complex. The globalisation of most of these elements means it is becoming more difficult to control, as 2013 scares about horsemeat in processed foods demonstrate.
- We need to consider food production, focusing on its environmental impact so that we are more informed, with knowledge leading to action.

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1. Introduction

Food production and processing occur in every country and in most communities. Its widespread nature and the numbers involved worldwide result in a significant environmental impact simply because of scale. However beyond universality, food production impacts on the environment in both positive and negative ways which are unique. This raises issues related to balance with other activities and reducing environmental disbenefits such as adverse effects on biodiversity but also the optimisation of its positive features such as the storage of carbon in the soil.

All of this sits within a debate about sustainable consumption and about the use of water; land, energy etc and their unequal divide between rich and poor nations, population growth and the totality of resource use.¹ This debate links to the international discussions about global climate change (GCC). In considering these issues it is important to remember that the future is not fixed. Society, as it is now, is a human construct, markets are not sacred, and we can change what we don't like, if we work together. The need for knowledge and the universitality of processes and systems, provide the rationale for an Eco-congregation Ideas for Action guide on food.

The whole guide consists of four Parts, each of which can be used independently. This Part details basic problems and provides information about current church initiatives as examples of what can be done. Other Parts of the guide provide more detailed information for those who wish to go deeper, Bible Studies linked to food issues and a list of useful contacts.

2. The Importance of Food

Background

- Food production, processing and retailing is one of the major industries of the world. It involves large farming companies, machinery manufacturers like John Deere, grain suppliers like Cargill, financial institutions like Goldman Sachs, chemical and biotechnology companies like Monsanto and retailers such as Wal-Mart. It also involves millions of small producers, especially in Africa, Asia and South America, but also in Scotland.
- In Scotland food production and processing is one of our more important industries² accounting for almost one third of manufacturing income and almost a quarter of jobs. The food and drink sector and the food chain in Scotland are responsible for gross added values of £4.8 and £10.5 billion, turnovers of £11.9 and £34.0 billion and the employment of 113,800 and 360,000 people respectively. Agriculture alone involves 68,000 people.

¹ Christian Aid (2013) Hungry for Justice: Fighting starvation in an age of plenty p.74.

² Anon (2012) Food and drink in Scotland: Key facts 2012. Scottish Government, Edinburgh.

- In 2010 Scotland exported produce valued at £5.9 billion to the rest of UK and £4.5 billion of produce to European Union.
- Despite the large amounts of food produced in Scotland we import large quantities of food including live animals, fruit and vegetables. Most of our imports come from the EU, Latin America and the Caribbean. Our environmental food print for food thus relates both to Scotland and the countries from which we import.
- Despite the importance of food production our consumption of fruit and vegetables, 3.5 portions per day, is lower than that in the remainder of UK. This is linked to a greater consumption of processed products with a higher environmental footprint. While marginal to environmental impact diet links to our national ill health and the environmental costs of health care.
- The food industry produces almost 9,000 tonnes of food related waste per year, almost half of this contributed by packaging. This waste generates almost 8,000 tonnes of CO2.
- Households are responsible for almost 600,000 tonnes of waste much of it potentially avoidable. Pre-prepared meals account for 7% of total food and drink related waste by weight but over 11% in terms of cost.³ Reducing food waste represents a significant goal both in relation to increasing the amount of available food and in reducing its environmental impact.
- Any activity involving both firms trading at an international scale and small local units will lead to clashes in values. Over recent years the source of our global food supply, the role of the "Market" and the place of biotechnology in food production have all been areas leading to a clash in values.

Environmental Impact

- The production of food will always impact on the environment. Much relates to changed land use and vegetation composition and so **biodiversity**⁴. We cannot preclude all impact but we can influence its extent.
- Key issues to the ways in which the growing of food impacts upon the environment (Table 1) are the amounts of food produced by different types of production, the quantities of carbon

³ Anon (2012) Food and drink in Scotland: Key facts 2012.

⁴ **Biodiversity.** An indicator of the numbers and range of different living organisms present in a place or within a particular approach to agriculture.

stored in the soil as **organic matter**⁵ and the relative efficiencies of crop and of animal production in comparison to their environmental impact.

Food Production Type	Environmental Impact
Arable and horticultural production	Losses of biodiversity, initially release of Carbon (C) from the soil and reduced C storage, significant energy requirements if fertilisers and pesticides are used and the release of N2O from soil.
Livestock production	Reduction in total potential food production on some land, Methane (CH4) production by ruminant livestock but increased C storage in soil if grassland is present for a long period. A kilo of wheat requires 1-2,000 l of water for its production while a similar amount of beef requires 13-15,000l.

Table 1: The Environmental Impact of Food Production

World Population

- Population influences the total amount of food we need. Current projections estimate the future world population as around 9 billion in 2050, 34% higher than now.
- The prospect of an increasing world population leads to concerns that the food poor will increase both within the developing world but also in parts of the world currently adequately fed.
- How can a population this large be fed? Most solutions tend to focus on the need to produce more food in total. However the amount of land is finite and so increased production, on this basis, could only come from increasing yields.
- More from the same land area would require more efficient varieties and more inputs so crops and animals focus more of their resources on producing our food. However although food production has been at record high levels in recent decades around 800 million food poor remained.
- Simply producing more is not the whole answer; distribution and the economic ability to purchase food, seem more important.

⁵ **Organic Matter.** The amount of organic carbon based material, which is responsible for soil having a structure, which facilitates the activities of microorganisms.

• A related issue is food waste.⁶ A recent study estimated that of the four billion tonnes of food produced on the globe 30-50% is wasted. In the developed world more of the food produced reaches the market but 30% of the UK vegetable crop is not harvested because it fails to meet supermarket standards and as much as 30-50% of purchased food can be thrown away uneaten.

Global Climate Change (GCC)

- There is consensus that GCC is driven by increasing atmospheric concentrations of Carbon Dioxide (CO2), Methane (CH4) and Nitrous Oxide (N2O), all direct or indirect products of our use of fossil fuels⁷.
- All industrial processes release **green house gases**⁸ (GHG's). The make up of the gases released by industry in general, is CO2 86%, CH4 7%, and N2O 6%. In food production the profile is the more damaging CO2 11%, CH4 36%, and N2O 53%. This difference is largely due to primary production with the on farm component responsible for 67% of this.
- For most of us our food footprint is around 20% of a western carbon footprint. The UK's annual C footprint due to food is around 170 million tonnes, similar to the impact of use of fuels and electricity generation. (For more see section 6c)
- While crop production has the smallest Carbon footprint within agriculture it is modified by how and where the production occurs. The carbon footprint of crops is influenced by the use of fertilisers; their addition to a single ha. of land adds around 2 tonnes of CO2 to the footprint.

⁶ Institute of Mechanical Engineers (2013) Global Food: Waste Not Want Not.

⁷ Tinker PB (1993) *Climate Change and its Implications,* pp.3-12, in *Global Climate Change* (ed. D Atkinson) BCPC, Farnham, Surrey.

⁸ **GHG**. The burning of fossil fuels results in the release of CO2 to the atmosphere. CO2 prevents heat, generated on earth from leaving and so results in generalised warming. Other gases released from human activity such as methane work in a similar way but are more potent.

<u>3. Contentious Issues</u>

Different Approaches to Food Production

- Not all global food production uses western intensive methods. Small farms, using traditional approaches, produce around half of the world's food. A further 20% comes from fishing, bush meat and home production.⁹
- Current world food production could supply us with enough macronutrients e.g. energy and protein to feed around 14 billion people.¹⁰ Humanity monopolise around 40% of the global land surface, including 25% for the production of food. We have replaced a third of tropical forest and a quarter of natural grassland.¹¹ In addition agriculture is responsible for 85% of human water consumption.
- Asking a simple question like, from where does the world's current food supply come leads us into controversy. There are no straight factual answers to questions with a substantial policy or political element.
- Debates about the merits of different ways of producing food have become bitter with the two major standpoints organic or intensive constantly attempting to undermine the claims of the other. The virtues of the different approaches are different (Table 2.)
- In temperate agriculture, especially where fertilisers and irrigation remedy deficits in nutrient supply and water availability, intensive methods normally lead to higher yields. In the west organic yields are not uncommonly 10-20% lower than those from intensive chemically driven systems.
- In tropical and arid climates the maintenance of soil structure is critical to water supply. Here organic methods, especially those employed on small farms, lead to increased yields. In developing countries, especially where farming is on fragile soils, organic yields can be close to double those from chemical cultivation.
- Such systems tend to be more resilient economically reducing the risk of debt and so providing better results in bad crop years. The detailed management needed for such systems keeps them small in scale.

⁹ IAASTD, quoted by Tudge.

¹⁰ Heren H, Millennium Institute Washington, quoted by Tudge.

¹¹ World Resource Institute (2000) Domesticating the world: Conversion of natural ecosystems.

Intensive Arable	Organic Rotation
Yields maximised and many labour and management costs replaced by chemical inputs	Yields optimised while retaining a focus on biological cycles and the involvement of labour as key aims.
High externalitie s ¹³ such as losses of fertiliser to ground water and the consequences of reduced labour accepted	Many externalities such as nutrient losses and the carbon costs of agrochemical inputs minimised or eliminated
Biodiversity protection often restricted to headlands. However higher production per unit area may reduce the land needed for food production.	Biodiversity enhancement a design criterion

Table 2: Core Values Associated with Different Approaches to Food Production.¹²

Small Farmers and Communities

- With help to improve transport infrastructure, finance for investment and market structures small scale farming in developing countries could increase the production of food by 25-35%. This food would be in the right place to have a real impact on the food poor.
- Emphasis on producing a commodity is linked to maximising efficiency; usually measured in production per worker, time unit, or land area. Such an approach can regard other things as **externalities**, costs not to be born by the business. They can include costs to the environment; by water contamination and damage to soils, or damage to communities.
- An increasing number of international bodies are now recognising the importance of moving agriculture away from mere technologies and to methods centred on social and environmental considerations
- Alternative systems can enhance the role of small-scale farmers and practices such as crop rotations. Recently UN agencies have argued that in developing countries organic agriculture can increase productivity and raise incomes using low cost local technologies, which mimic natural processes.

¹² Modified from Atkinson D and Watson CA (2000) *The research needs of organic agriculture: Distinct or just the same as other agricultural research.* Proceedings BCPC Conference on Pest and Diseases, pp.151-159. 13 **Externality**. Originally a term in economics to describe things, which sat out, side the assessment. It includes costs not borne by the producer such as environmental impacts like the impact of greenhouse gases, nitrates from nitrogen fertilisers on the water supply. It can include social effects such as the destabilisation of communities.

• A change in the predominant model for production needs to be accompanied by initiatives to create access to markets providing fair returns to producers. These issues are also important to Scottish Farming.

Biotechnology

- Biotechnology is commonly advocated as the painless way of solving many of our food problems by allowing the production of more food without other changes. It is wider ranging than just **GM crops**¹⁴ although often discussions become reduced to a debate around crops developed using **recombinant DNA technology**¹⁵.
- This is unfortunate because biotechnology has more to offer than just GM Crops, which have only been around for 20 years.¹⁶
- The debate has however covered issues related to:
 - 1. The safety of GM derived foods; the general consensus is that they are safe.
 - 2. Their impact upon the environment; the consensus is that they, and associated cultural methods, can have a negative impact on biodiversity.
 - 3. Effects on the structure of farming, essentially who farms and how; the consensus is that it will result in more power and influence flowing to multinational and large companies and so disadvantage small producers.
 - 4. It can impact the status of organic producers through the transfer of GM traits to organic crops.
- Churches can contribute to the debate by asking biblical **'Wisdom'**¹⁷ related questions based on a reasoned search for ways to ensure wellbeing and to transmit hard earned knowledge to subsequent generations.¹⁸

¹⁴ **Genetically Modified Crops**. Crop plants and other organism which have been changed by the introduction of new genetic material (DNA) usually from very different species e.g. bacteria, using recombinant DNA methods rather than traditional approaches like pollination.

¹⁵ **Recombinant DNA**. Biotechnological techniques, which allows the introduction of DNA from other species into the genome of a crop.

¹⁶ Bruce D and Bruce A (eds) (1998) *Engineering Genesis*, Earthscan, London.

¹⁷ **Wisdom**. The Wisdom literature advises us on appropriate things to do and approaches to life. The principles contained here can be applied to new technologies.

¹⁸ Crenshaw JL (1998) *What is Wisdom?* pp3-9 in *Old Testament Wisdom*, Westminster John Knox Press, Louisville, Kentucky, USA

- In addition whether the food produced by the system has **embedded values**¹⁹ compatible with scripture is important to any discussion on whether a suggested change is acceptable.
- Discussion of any new technology must examine present production and the full range of options for meeting future needs. The current and possible future yields obtainable for food crops, such as wheat provide an approach to this.
- The current situation suggests:
 - 1. First, in the UK there is great variation in the yields achievable with a similar genetic base hence scope for increasing yields with current genetics.
 - 2. Second, the gap between the yields of poorly performing farms and those producing record yields is a similar to that between those producing record yields and the potential maximum. Achieving the maximum requires radical new technologies. Applying the practices currently used on good farms could help minimising the poor to record gap.
 - 3. Third, increasing the average yields obtained by world agriculture would increase total food production on current land areas although this may need increased inputs.
 - 4. Fourth, there is scope to increase the yields of organic production systems through a better understanding of limiting factors such as sub-optimal nitrogen supply.²⁰
- Research to explore all of these potential routes seems wise, but within a balanced approach.
- Biotechnology could reduce the environmental footprint of western crop production. However economic and power relationships affect land use and communities, especially in the developing world.
- There is concern that the current patenting of genes related to water use and drought resistance by large international companies²¹ could lead to small producers in developing countries being blocked from using such methods.
- Dependence on the products of international companies has in the past resulted in financial pressures, which have led to poor care of the land, and changes, which have destabilised communities whose investment in the land had resulted in good management.

¹⁹ **Embedded Values**. All foods have characteristics, which can be measured. These are the basis of food standards. Foods also have embedded values, which are a consequence of whether their production was destructive to the environment and whether they were fairly traded.

²⁰ Institute of Mechanical Engineers (2013) Global Food: Waste Not Want Not.

²¹ ETC Group (2008) Patenting the climate genes. Communique99, pp.1-30.

Supermarkets

- In our current society Supermarkets supply us with most of the food which most us eat. The supermarket share of the food we consume continues to increase and as a result alternative such as small retailers' decreases.
- Supermarkets have increased the range of products to which we have access and have also reduced the proportion of income spent on the weekly food shop (partly through the pressure big buyers exert on small producers, both globally and locally).
- The power of supermarkets means that they have a huge impact on both markets and on how the land base of producers is managed.

4. The Churches and Food

Recourse to Scripture is an appropriate starting place for beginning action. The Bible reminds us that how we live as individuals and societies will affect others. Scripture focuses us on compassion, humility and reverence and not on cost efficiency or cost benefit.

- Food is one of the most frequently-mentioned topics in the Hebrew Scriptures and receives significant attention in the Gospels, for example in the parables. In the parable of the Good Samaritan (Lk 10, 30-37) Jesus emphasised the importance of sharing things and gave us a definition of neighbour, which was totally inclusive.
- Food is at the heart of the Eucharist (Luke 22, 17-20) and as a consequence was at the centre of worship in the early church.
- The subject of what might and might not be eaten was at the heart of many powerful debates (Acts 15, Acts 10, 1 Corinthians 8, 4-13, 10, 25-32, Romans 14, 2).

Partnership with God

- As with every aspect of being part of God's creation how we regard food is influenced by the responsibility of having been created in God's image. The concept of dominion (Gen 1, 26 -28) is tempered by our having been made in God's image (Gen.1, 27) and the garden image (Gen 2, 8-10, 15).
- The production of food is the result of a partnership where God provides the intellectual property and the capital and we humans use these gifts to produce our food under licence.

• What has been given is recognised in the prayers used at the offertory within many of our churches, *"Blessed are you Lord God of all creation, through your goodness we have this bread to offer, which earth has given and human hands have made."*²²

Sharing creation

- Together with guidance as to how food is to be honoured (Deut 14, 21) there is also emphasis that sharing the gifts from God is important. The hungry may eat both grapes and grain so as to meet immediate needs but may not harvest what has been grown by others (Deut 23, 24-25).
- Those with a harvest had an obligation to share (Ruth 2, 2-3). Leviticus was clear that the goodness of God was to be shared by not reaping up to the edges of the field or collecting what could be left for gleaners, such as Ruth, and that similar strictures applied to all crops including grapes (Lev 19, 9-10).

The Market Economy

- Food was not always plentiful in Israel in the period covered by Genesis. The section devoted to Joseph illustrates some of the complications associated with large-scale production and its interrelationships with power and control.
- The conduct of Joseph and Pharaoh in centralising power is not disapproved in Genesis but the exercise of power must be reasonable and should not result in unreasonable pressure as exemplified by the parable told by Nathan about the poor man and his lamb (2 Sam 12, 1-6), the story of Naboth's vineyard (1Kings 21, 1-10) or Jesus' parable of the man whose barns were too small to accommodate his crops (Luke 12, 16-20).

Joy

- Above all, one of the elements which come from reading about food in scripture, is a feeling of joy associated with food and food production. In the story of Ruth the sharing of production between the owner Boaz, the gleaners and the animals who made use of the headlands resulted in a joyful harvest celebration (Ruth 3, 1-5)
- This was an out working of the joy of the harvest also seen in Deut 16, 9-12. In addition much of Jesus' teaching was done in the setting of a meal at which there was clearly much Joy.

²² SEC (1982) Prayers of Offering in Scottish Liturgy 1982

5. Actions by Christian communities

Provision of reliable information

- It is important that debates occur with accurate information and that food production, vital as it is, is seen in a context which recognises other equally important issues e.g. **biodiversity** and community structures.
- It is clear from the GM debate of the late 1990s that churches can have a major role as an honest broker.²³
- Organisations such as Nourish, currently funded by Scottish Government, provide independent information on the global food system, food production in Scotland and on food and health issues.²⁴

Becoming active consumers

- The growth of the Fair Trade movement and the creation of Fair Trade towns, churches and schools occurred because people asked questions about where their food came from, how it was produced and whether producers were properly recompensed.
- The change in the production of eggs from battery cages to free range and other methods and the need for means of production to be indicated on the pack came because consumers asked questions and indicated that they were would pay the costs associated with higher welfare standards.
- In many aspects of life it is clear that we have much more power as consumers than as citizens.

Use opportunities to focus on issues

- Seasons of the church year (rogation, harvest, etc.) provide natural opportunities for focus on food issues.
- The rising use food banks provide opportunities to discuss equity issues in respect of the distribution of food.²⁵ For some the cost of food can now be as low as 10% of income. For the previous generation it was around twice that and for the generation before that twice that. Many of the food poor in Scotland and elsewhere remain in the situation of our grandparents.

²³ Atkinson D, Harvey W, Leech, C, McEvoy T, Paterson, S, Rawson, R, Reid, W, Rice, D, Robb, M, Sanderson, L, Whiteman, R, Woodside, J (2012) *Food Security: A churches together approach*. Rural Theology 10, pp.27-42.

²⁴ Feeding the Five Million, 2013 Conference Report, Nourish. www.nourishscotland.org.uk

²⁵ Johnstone M (2013) Food banks are not sustainable.

• The foods available from food bank need to have long shelf lives and so commonly contain imported with a significant carbon foot print and require to be heated prior to consumption which is often an insurmountable cost and adds to the foods' carbon footprint.

Being a producer and provider

- There is great scope to promote the community food sector²⁶. Churches can be active in the development of community food hubs and in facilitating local food partnerships.
- The church as a whole is a significant landowner. Church land can be used for the production of food either by the church or through local community groups. If this supplies local outlets then the food chain is short and the carbon costs of distribution low.
- Churches can be active in connecting local small producers with food banks and community outlets and again through this route can reduce the carbon cost of food as well as making quality food available to the food poor.
- As well as running food banks many churches run drop-in centres and cafés. Ventures of this type are an opportunity to connect with local producers and through the purchasing policy to promote environmentally sustainable farming.

Examples of Eco-Congregation food projects around Scotland

Fairlie Parish Church (Third Eco-Congregation Award winners)



"The Fairlie Growers took on a derelict old boatyard site in the village to develop a community garden where villagers can learn to grow-their-own herbs, fruit and vegetables organically using intensive, raised bed, horticulture methods. The Growers aim to process all their own garden and kitchen waste by composting and vermiculture. All their carbon waste is incorporated into the soil producing

²⁶ Feeding the Five Million, 2013 Conference Report, Nourish. <u>www.nourishscotland.org.uk</u>

healthy, high yielding, food crops ... and fresh, healthy food produces healthy families... It brings together people of all ages from the community."

http://www.fairlieparish.co.uk/11GARDENERS/11gardeners.htm



Skene and Trinity Parish Churches (Second Eco-Congregation Award winners)

Skene and Trinity Parish Churches have set up a "Dig for Creation" potato project. This is used both practically and educationally to involve the congregation with the planting and explain the project's merits of growing your own to the local community. They have an active gardening / growing group involving congregation members of all ages.

http://www.skeneparish.com/eco-congregation-group.html

St Andrew's Scottish Episcopal Church, St Andrew's (First Eco-Congregation Award winners)

St Andrew's have encouraged members of their congregation to bring homegrown or locally sourced food into church in order to convert into jams, chutneys, pies, and so on over the Harvest season. These were sold to fundraise for the church. Plant swaps and sales in the spring have been a good way of sharing local seed varieties and encouraging plant resilience. The church's youth group have worked with other local voluntary organisations to plant trees in the local Commonwealth Orchard to provide fruit for the community.

Menzieshill Parish Church



"The giving garden is a project at Menzieshill Parish Church in collaboration with the Eagles Wings Trust and Gowriehill Primary School. The infrastructure is nearing completion consisting of 9 vegetable plots, a fruit cage, polytunnel and garden shed. Volunteers from Castle Huntly and Eagles Wings Trust have carried out the preparatory work over a period of six months. Salvation Army volunteers painted the main perimeter wall and church members painted the wooden fence surrounding the plots. A competition to design a logo for the garden sign was entered by pupils at Gowriehill Primary School. The winner was "The Giving Garden" and local artists used runners up pictures as designs for a mural painted on the perimeter wall. One of the plots which surrounds the tree is for the use of the school and they will grow their own veg and when harvested will put into soup packs with a recipe included." <u>http://www.menzieshillparishchurch.org.uk/index.php?page=giving-garden</u>



Cadzow Parish Church (Second Eco-Congregation Award winners)

Cadzow Parish Church holds an outreach café every Friday afternoon to provide a safe space for school students to meet friends. It provides food at below-cost prices in order to make it an affordable social space for the local community.

http://www.cadzowchurch.org.uk/index.php?option=com_content&view=article&id=124&Itemid=64

St Anne's, St Bride's and St Thomas' Roman Catholic Parishes (First Eco-Congregation Award winners)



These three parishes have undertaken a number of food-related projects, including the collection of Christmas food hampers for those vulnerable and hungry over the holiday season; a Fairtrade wine tasting evening; harvest time food collections; and a commitment to serving Fairtrade tea and coffee in the church buildings.