

# **The Impact of Peak Oil on Rural Communities**

A Report Produced for the  
Groundswell Group, Cornwall

July 2007

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# The Impact of Peak Oil on Rural Communities

## 1.0 Summary

Over the next few years, as the price of oil increases and its availability declines dramatically on a global scale, there will be profound and far-reaching effects across society. This report collates information on what has been termed 'Peak Oil' both globally and for rural communities and centres on a discussion of the principal areas that will be affected by escalating oil prices.

Although Cornwall has been taken as the focal point, the recommended responses can, and should, be applied to any rural community. Indeed, many of the recommendations have been influenced by the case of Cuba where the country experienced a Peak Oil situation for political rather than geological reasons. A study of the Cuban example can be found at the end of this report.

This report reveals the far-reaching and dramatic impact of Peak Oil on the life and economies of rural settlements. The government will find it increasingly difficult to alleviate the numerous and worsening stresses within local communities from Whitehall. By necessity local communities will have to take greater responsibility themselves for their own future, designing and implementing solutions fashioned by local conditions. This is the time for us to prepare for a uncertain future.

## 2.0 Introduction

### 2.1 How much do oil prices need to rise by to have a noticeable effect on the economy?

'If you want to ponder just how devastating oil prices in the \$200/barrel range will be for the US economy, consider the fact that one of Osama Bin-Laden's primary goals has been to force oil prices into the \$200 range.

Oil prices that far north of \$100/barrel would almost certainly trigger massive, last-ditch global resource wars as the industrialized nations of the world scramble to grab whatever oil is remaining.<sup>1</sup>

See: <http://www.communitysolution.org/ppts/GreatestChallenge.ppt>  
PowerPoint 16 shows the impact of oil price rises on inflation.

### 2.2 How much oil do we consume from day to day?

- 'Oil provides 40% of our primary energy, and 95% of all our transportation fuel.'<sup>2</sup>
- 'In the US, approximately 10 calories of fossil fuels are required to produce every 1 calorie of food eaten and the average piece of food is transported almost 1,500 miles before it gets to your plate.'<sup>3</sup>
- 'In Canada, the average piece of food is transported 5,000 miles from where it is produced to where it is consumed.'<sup>4</sup>

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<sup>1</sup> <http://www.lifeaftertheoilcrash.net/>

<sup>2</sup> <http://www.communitysolution.org/ppts/GreatestChallenge.ppt>

<sup>3</sup> <http://www.lifeaftertheoilcrash.net/>

- 'According to the Organic Trade Association, the production of one pair of regular cotton jeans takes three-quarters of a pound of fertilizers and pesticides.'<sup>5</sup>

Currently, 1 barrel of oil is found for every 5 barrels consumed.<sup>6</sup>

### 2.3 What is the impact of the rising price of oil?

- The economic recession of the 1970s was triggered by a shortfall in the availability of oil of approximately 3%.
- As the actual cost of oil rose eightfold from under \$5 a barrel in late 1973 to nearly \$40 a barrel in 1980 (the equivalent now to \$70),<sup>7</sup> so the inflation adjusted oil price rose from around \$15 a barrel to \$94.28 a barrel at its peak in 1980. This means that whereas the actual price of oil rose by around \$35, the inflation adjusted oil price rose by nearly \$70, double that of the actual price of oil.<sup>8</sup>

## 3.0 Cornwall: The Impact of Rising Oil Prices on...

### 3.1 The Economy and Society:

'Miles driven will decrease and people will drive more fuel efficient vehicles...Living in a suburb will become more difficult since cars won't be able to be used as much to get around. Families will likely spend more time with each other.'<sup>9</sup>

'People may need to work from home at least part of the week...farming families may find that one or more person may need to find work elsewhere.'<sup>10</sup>

'Without timely mitigation, world supply/demand balance will be achieved through massive demand destruction (shortages), accompanied by huge oil price increases, both of which would create a long period of significant economic hardship worldwide.'<sup>11</sup>

- Expect inflation and a contracting economy.<sup>12</sup>
- Costs for everything will rise, including electricity, fuel and heating. All products, including food, will be more expensive to produce, transport, and store (refrigerate).<sup>13</sup>
- Food spending as a percentage of income will rise.<sup>14</sup>
- Because energy prices and the economy are so closely linked, an economic recession will be a likely consequence. Rising national and consumer debt, increased unemployment, and increased social unrest will all follow.<sup>15</sup>
- Airlines and the tourist industry will be hard hit.<sup>16</sup>

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<sup>4</sup> <http://www.lifeaftertheoilcrash.net/>

<sup>5</sup> <http://www.ota.com/index.html> See the 'Farming and Agriculture' section for the oil needed for fertiliser and pesticide production.

<sup>6</sup> <http://www.communitysolution.org/ppts/GreatestChallenge.ppt>

<sup>7</sup> [http://www.scotexchange.net/tomorrow\\_s\\_newsheets\\_180506.pdf](http://www.scotexchange.net/tomorrow_s_newsheets_180506.pdf) p.3

<sup>8</sup> <http://www.communitysolution.org/ppts/GreatestChallenge.ppt> p.16.

<sup>9</sup> <http://www.communitysolution.org/problem.html#12>

<sup>10</sup> <http://www.ers.usda.gov/AmberWaves/April06/Features/Energy.htm>

<sup>11</sup> <http://www.powerswitch.org.uk/portal/index.php?option=content&task=view&id=497&Itemid=2>

from the Hirsch/US DoE Report.

<sup>12</sup> [http://www.apple-nc.org/appleseeds\\_intro.html](http://www.apple-nc.org/appleseeds_intro.html)

<sup>13</sup> [http://www.apple-nc.org/appleseeds\\_intro.html](http://www.apple-nc.org/appleseeds_intro.html)

<sup>14</sup> <http://www.communitysolution.org/problem.html#12>

<sup>15</sup> <http://www.communitysolution.org/problem.html#12>

- In the worst case, we may see "resource wars," hoarding, irregular deliveries, rationing, power outages and wide-spread unemployment.<sup>17</sup>

According to the Soil Association, there could be one of two scenarios (mainly based around agriculture). The pessimistic scenario would involve, amongst others:

- Short-term and increasingly nationalistic Government policies which will detract political attention and funds from other issues (such as more war in the form of foreign invasions to secure energy supplies).
- Significant pressure for government investment in securing conventional and centralised energy sources, i.e. nuclear and coal, which would slow the transition to renewable sources.
- Significant pressure for government subsidies to support energy-dependent industries, such as industrial farming.
- Change or even possible reversal of the comparative power and stability of countries, with those that are more 'developed' and thus more dependent on fossil fuels and trade, becoming less wealthy and stable.
- Changes in strategic alliances between countries, leading to different political influences and trading arrangements.<sup>18</sup>

See the following 'Farming and Agriculture' section for information on the second, 'optimistic', scenario.

On a local level this will mean:

- Cornwall is always one of the first regions in the UK to be hit by recession and one of the last to emerge from it. However, demand for land for biofuels and wind farms etc is likely to lessen the blow to the economy in the short-term.
- Rising debt and inflation, as well as changes in foreign policy, will restrict people's and the government's long-term financial outlook and their willingness to invest. On a local level, in Cornish towns and villages, this will affect both outside investment from second homeowners, which will have a direct impact on the services sector, and government investment in schools and local amenities.
- Cornwall's economy being heavily reliant on tourism, it will be hard hit by economic recession, with less people being able to afford holidays. However, in the short-term this will mean that UK visitors head to Cornwall rather than abroad as the latter will become much more expensive. In the long-term inflation will see the near cessation of long-distance holidays, whether abroad or within the UK.
- The impact of climate change on the tourist industry will similarly need to be taken into account, as wetter summers will dissuade visitors from coming to Cornwall. This will complicate the effect that Peak Oil will have on the tourist industry, as although tourists will not wish to travel long distances, neither will they wish to holiday in the rain...
- People will have to prioritise necessary products over luxury items. Heating will become more expensive and compete with money available for foodstuffs. This is likely to affect the poorest first, with increased deaths of elderly people during winter months, for example.
- Families will be put under more pressure to live together; people will need to live in groups to enable maximum energy efficiency and to reduce living costs.
- There will likely be peaks in non-renewable fuels and commodities other than oil. An increase in the cost of commodities such as tin will have implications for Cornish mines, which could be reopened.

Community responses should include:

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<sup>16</sup> <http://www.communitysolution.org/problem.html#12>

<sup>17</sup> [http://www.apple-nc.org/appleseeds\\_intro.html](http://www.apple-nc.org/appleseeds_intro.html)

<sup>18</sup> <http://www.soilassociation.org/web/sa/saweb.nsf/89d058cc4dbeb16d80256a73005a2866/cccdcd1cb99f29c8802571960051175e?OpenDocument>

- Taking action on a local level to reduce heating costs and maximising efficiency by, for example, advising people about energy efficient home insulation or arranging for community oil deliveries such as in Waterrow, Somerset.<sup>19</sup> The most vulnerable within the community, such as the elderly or those with young children, should be encouraged and helped to improve their home insulation.
- Small scale community projects can help people to build up networks of contacts in their local area. This will be especially desirable to help deal with the problem of the lack of amenities. People with important skills, such as doctors, will then be easily locatable in the event of an emergency.
- Please see the 'Tourism' section for more on the necessary responses to the impact on tourism.

### 3.2 Employment:

'The big box retailers' business model will be invalidated by lack of consumer income, by consumers' unwillingness to drive long distances, and by increased long distance transportation costs for goods. The progressive failure of the big boxes will create shortages of many goods. There will be great turbulence in the retail business and a resulting great inconvenience for consumers, as industry, agriculture, and commerce struggle to remake the retail business model.<sup>20</sup>

'Many families will have no employed member. Unemployment is likely to be at least as severe as it was during the depression of the 1930s. Families on low and average salaries will be stressed by the rising real costs of transportation, food, and most goods. Decreasing world oil production is almost certain to coincide with decreasing production of natural gas in North America. The resulting high prices of natural gas will add to the stress on middle and low income families during the heating season, as both heating oil and natural gas prices rise together.'<sup>21</sup>

On a local level this will mean:

- Widespread unemployment, which will cause economic and social depression.
- People living in rural communities will be especially hard hit as rising fuel and transportation costs will limit their financial capacity to commute. Those working in retail, who are often amongst the lower paid within the community, will be hard hit, as will those reliant on their vehicles for work such as postal workers, care in the community, delivery personnel etc.
- Considering the ageing population structure in Cornwall and the effect of rising oil prices on those working within the care industry, the lack of availability of care for the elderly is of a particular concern, especially those living in the most isolated areas.
- Whereas the growth of an agricultural sector that relies on human energy input rather than machinery could have a positive impact on Cornish employment rates, the service sector may suffer. Just as the increase in the number of second home owners boosted this sector, a decline in the number of second homes as a result of a weak economy will likely see the reverse happening.
- Wages will by no means match the rising inflation rates. People will be less likely to invest.

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<sup>19</sup> See: [www.ruralcommunities.gov.uk/files/Parish%20Plans%20Case%20Studies.pdf](http://www.ruralcommunities.gov.uk/files/Parish%20Plans%20Case%20Studies.pdf)

<sup>20</sup> <http://www.crudeawakening.net/index.htm#whatistheimpact> The 'big box retailers' business model' refers to large stores that rely on mass production and mass delivery. The name originates from the box shape of the building, which has large amounts of floor space and is typically located in suburban areas.

<sup>21</sup> <http://www.crudeawakening.net/index.htm#whatistheimpact>

- Many people will be forced to work from home, or in their local area. This will be made easier thanks to the internet which will allow people to work from home more easily.

Community responses should include:

- A move towards decentralisation, especially where food is concerned. Centralised industry will suffer as a result of people's inability to reach large supermarkets on a regular basis, or even at all. A decentralised food system will increase job opportunities in the local area and facilitate access to food. This will become vital when people are forced to travel less.
- Encouraging local participation in environmental projects such as woodland care, recycling schemes or farmers market projects at this stage will help local communities to deal with the effects of Peak Oil by both providing for themselves and by creating (albeit unpaid) a certain type of sustainable employment in their local area. During times of high unemployment, this would help alleviate general social depression.
- Some sort of local support scheme for the most vulnerable people, such as the elderly, should be set up. Those who live in isolated areas and rely on care workers on a daily basis will suffer greatly as transport costs reduce the amount of care they are able to receive.

### 3.3 Energy production:

'Political pressure is likely to keep electricity prices from reflecting the full cost of electricity. Since individual households can simply acquire electrical resistance heaters and plug them in, home heating will shift away from oil and natural gas toward electricity. This shift will place a rapidly increasing burden on the electrical system, which will react by introducing rotating blackouts during high load hours. Many families will move in together to reduce and share heating costs. Many houses, especially in distant suburbs, will be abandoned.'<sup>22</sup>

'Natural gas is not a solution but an enormous problem: even if the global peak in gas production is 10 to 20 years away, regional shortages are already appearing and will continue to intensify. This means enormous risks for home heating, for the chemicals and plastics industries, and for electrical power generation. Natural gas is and will always be a fuel that is, for the most part, regionally traded (as opposed to liquid fuels, which are more easily shipped). Thus for many nations critical to the world economy—the U.S., Britain, and most of continental Europe—gas cannot serve as a "transition fuel."<sup>23</sup>

'As the UK will not be an oil-producing nation by 2015 and in order to reach carbon emissions targets, a new generation of nuclear power stations will be operating across the UK post 2015.'<sup>24</sup>

On a local level this will mean:

- Heating problems (as mentioned under the section on 'The Economy and Society).
- Frequent blackouts which will further impede business and damage the economy, whether local, regional or national.

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<sup>22</sup> <http://www.crudeawakening.net/index.htm#whatistheimpact>

<sup>23</sup> <http://www.energybulletin.net/24529.html> this article also talks about nuclear power and coal and asks: would supplies run out in 30 years time if they were put under enormous pressure in replacing oil?

<sup>24</sup> [http://www.scotexchange.net/tomorrow\\_s\\_news-sheet\\_180506.pdf](http://www.scotexchange.net/tomorrow_s_news-sheet_180506.pdf) p.12

- Small, rural communities may feel increasingly isolated as blackouts and temperamental electricity supplies, added to a reduction in transport availability, decrease their contact with those outside of their town or village. The psychological effects of this, especially in the short-term for those living in villages where many of the homes are left permanently empty, having been bought by second homeowners who can no longer afford to visit, could be far reaching. On the other hand, it is likely that people in rural communities will pull together during such times.
- An increased interest in renewable energy sources will see Cornwall house more wind turbines and offshore energy projects. This will lead to increasing tension between those for and against wind farms. Community wind farms may become the norm to reduce political pressure.<sup>25</sup>
- There is likely to be an increased focus in the potential for nuclear power generation in Cornwall which will similarly be a cause of tension between those for and against nuclear power.
- There is a high likelihood that land for biofuels will compete with land for food. Substituting crops for biofuels will lead to competition between food and fuel with the poorest being the first to suffer from escalating food costs.
- Production of wood for fuel or for carbon offsetting or carbon 'sinks' will likewise compete with land for food or biofuels.

Community responses should include:

- Looking increasingly towards decentralised forms of energy and energy self-sufficiency.
- Local community empowerment, as the government will be unable to provide the desired levels of energy for the whole country. Different regions and localities will increasingly need to provide for themselves, and models of how this can be achieved should be encouraged as soon as possible. People need to be given the confidence to feel that they can deal with the impacts of Peak Oil.
- Creating a sense of community in such localities at an early stage will better help these communities deal with the impacts of Peak Oil as and when they occur. The internet will similarly help those in rural communities feel less isolated from the outside world as transport and travel becomes priced out of reach.
- The early communication of the likely impacts of behaviour that tries to maintain current levels of consumption via technological fixes. A reliance on biofuels, coal, and nuclear as a means by which to avoid having to adapt to a low-energy economy is likely to deny power to local communities. A continued reliance on a volatile, centralised system will leave communities much more vulnerable to change at government level.

### 3.4 Fuel and Transport:

'Improved fuel efficiency in the world's transportation sector will be a critical element in the long-term reduction of liquid fuel consumption, however, the scale of effort required will inherently take time and be very expensive. For example, the U.S. has a fleet of over 200 million automobiles, vans, pick-ups, and SUVs. **Replacement of just half with higher efficiency models will require at least 15 years at a cost of over two trillion dollars for the U.S. alone.**'<sup>26</sup>

'The mitigation of peak oil is required on both the demand side and the supply side. On the demand side we have to make the world stock of vehicles much more fuel-efficient as soon as possible. We also have to introduce policies and incentives that will make the world's population less dependent upon driving vehicles and

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<sup>25</sup> [http://www.scotexchange.net/tomorrow\\_s\\_news-sheet\\_180506.pdf](http://www.scotexchange.net/tomorrow_s_news-sheet_180506.pdf) p.12

<sup>26</sup> <http://www.powerswitch.org.uk/portal/index.php?option=content&task=view&id=497&Itemid=2>  
from the Hirsch/US DoE Report.

automobiles. Increased use of mass transit, rail system, smart growth, what have you. On the supply side, we have to pursue all of the supply options that are out there for liquid fuels, including oil shale, oil sands, colder liquids, renewable technologies, biomass, bio-diesel, electrical vehicle, plug-in electrical vehicles, et cetera. So a massive effort is required both for the supply side and the demand side to address the problem. [...] Petrol prices could increase dramatically, there would be shortages. There would be some sort of rationing. The entire country would be severely affected as your whole transportation system would be severely disrupted. People who have to drive to work, or to industry to commerce, would simply be unable to get there at any reasonable prices. The potential would be for massive economic and social dislocation...we have done extensive modelling and there's virtually no industrial sector that would be immune.'<sup>27</sup>

'Rising transport costs will affect rural communities more as they make longer journeys.'<sup>28</sup>

'Only about 15% of the energy from the fuel you put in your tank gets used to move your car down the road or run useful accessories, such as air conditioning.'<sup>29</sup>

Oil shortages could lead to fuel riots.<sup>30</sup>

An increase in the demand for biofuels would compete with land for food, again pushing food prices up. This is already happening globally, with 2007/8 being the seventh year out of eight where global grain production has fallen short of demand.<sup>31</sup>

On a local level this will mean:

- Less available transport and fuel for transport: hoarding behaviour is likely to set in the at least in the short to medium-term.
- As discussed above, fuel and transport shortages would impact on employment and the availability of care in the community, amongst other aspects of everyday life such as food shopping, taking children to school, people's social life etc.
- Agriculture will become much more expensive. Intensive farming will be made uneconomically viable due to rising fuel and fertiliser/pesticide costs (agricultural machinery and vehicles, pesticides and fertilisers etc will be discussed below under 'Farming and Agriculture').
- Less and less reliance on cars and a turn towards other energy efficient modes of transport, such as bicycles?
- A new need for local amenities.
- Pressure on farmers to grow biofuels on their land (which could impede their ability to become self-sufficient, leaving them more vulnerable to inflation rates).

Community responses should include:

- The less a community is self-sufficient before the economic impacts of Peak Oil set in, the more likely it will suffer as a result. People need to be encouraged to reduce their vehicle usage if we are to avoid large scale violence as a result of a sudden fuel shortage.
- As aforementioned, local communities should look at how they can improve their local amenities, especially through the creation of farmers markets and local food

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<sup>27</sup> <http://www.abc.net.au/lateline/business/items/200706/s1956166.htm>

<sup>28</sup> <http://www.ers.usda.gov/AmberWaves/April06/Features/Energy.htm>

<sup>29</sup> The US Department of Energy <http://www.fueleconomy.gov/feg/atv.shtml>

<sup>30</sup> <http://www.soilassociation.org/web/sa/saweb.nsf/89d058cc4dbeb16d80256a73005a2866/cccdcd1cb99f29c8802571960051175e?OpenDocument>

<sup>31</sup> See: [http://www.nfu.ca/press\\_releases/press/2007/May-07/food\\_supply\\_crisis\\_grain\\_stocks\\_use\\_ratio\\_release\\_THREE.pdf](http://www.nfu.ca/press_releases/press/2007/May-07/food_supply_crisis_grain_stocks_use_ratio_release_THREE.pdf) and also <http://www.independent.co.uk/incoming/article2697804.ece> 'The fight for the world's food' 23/06/07.

production, as rising transport costs will decrease food availability, especially in rural areas.

- People need to understand how, in a food and fuel shortage situation, demanding that their fuel needs be met by biofuels is likely to come into direct conflict with food production.

...and for Public Transport:

- Parish and town councils should look to promote public transport as a short-term solution to rising transport costs. In the long term however, transport is likely to be priced beyond reach.
- People everywhere will need to think imaginatively about energy efficient transport systems such as opening up old railway lines, investing in bicycles etc. Projects that encourage people to use their bicycles more should be set up at this point.

### 3.5 The Environment:

'In response to the worsening economic climate, [there will be] more pressure to exploit natural areas and general downward pressure on environmental protection.'<sup>32</sup>

We will not be able to commit to long term strategies in a world where oil depletion has left our future uncertain. People will be less willing to invest in a problem they do not see as immediate, such as climate change, and more concerned about where their next meal will be coming from.

'In Kansas, the Coffeyville Resources refinery recently shut down after flooding caused a spill of at least 42,000 gallons of oil Sunday.'<sup>33</sup> Will climate change including increased flooding, rising sea levels and extreme weather events put an extra strain on oil production in the years to come?

On a local level this will mean:

- As aforementioned, increasing pressure on farmers to produce biofuels.
- On a local and global level, governments will be too concerned with the severity of the immediate problems to consider environmentally friendly behaviour. Environmental exploitation is likely to increase as a result.
- There will be less scope or money available for tackling the impacts of climate change in the medium to long-term that may affect Cornwall, such as flooding and rising sea levels.
- In local communities, woodland areas will be put under threat from those wishing to exploit them for fuel. This will aggravate soil erosion and climate change.
- Nationally and globally, governments are going to try to turn to coal to lessen the effect of Peak Oil on the economy, a solution that will lead to an increase in greenhouse gas emissions and hence worsen climate change.
- Crops may become harder to grow as adverse weather conditions alter growing seasons.

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<sup>32</sup><http://www.soilassociation.org/web/sa/saweb.nsf/89d058cc4dbeb16d80256a73005a2866/cccdcd1cb99f29c8802571960051175e?OpenDocument> 04/07/07

<sup>33</sup>[http://www.in-forum.com/articles/index.cfm?id=170798&section=News&forumcomm\\_check\\_return&freebie\\_check&CFID=41993067&CFTOKEN=77871796&jsessionid=8830453ac3b032a566c6](http://www.in-forum.com/articles/index.cfm?id=170798&section=News&forumcomm_check_return&freebie_check&CFID=41993067&CFTOKEN=77871796&jsessionid=8830453ac3b032a566c6) 'Shortage Fuel for Concern', 04/07/07.

Community responses should include:

- Community woodland projects. Local communities should be taught the importance of protecting local woodland areas in the hope that they will be less likely to exploit them in the long-term.
- Encouraging recycling and composting projects. These projects encourage people to reconsider the amount of waste they produce, and furthermore to teach them how to manage the waste they produce (dustbin collection is likely to decrease especially in rural areas as a result of escalating fuel costs). Waste reduction will likewise help tackle climate change.

### 3.6 Farming and agriculture:

'With the exception of a few experimental prototypes, all farming implements such as tractors and trailers are constructed and powered using oil; food storage systems such as refrigerators are manufactured in oil-powered plants, distributed across oil-powered transportation networks and usually run on electricity, which most often comes from natural gas or coal.'<sup>34</sup>

'The transition from a largely globalised food manufacturing industry to a largely decentralised and localised food manufacturing industry will not be easy nor smooth. Fewer people than before have the necessary skills to grow food by themselves. Urbanisation, land degradation and soil erosion have removed from agricultural use large tracts of land in both rich and poor countries alike. There is less land to feed greater numbers of people and water is becoming a major constraint in many countries. Peak oil will aggravate world food security already under stress.'<sup>35</sup>

'There will be an increasing interest in organic farming out of necessity as food prices continue to escalate.'<sup>36</sup>

'Lower energy crops will need to be grown and fewer journeys made.'<sup>37</sup>

At the beginning of the century, British towns and cities had around 2 million allotments. Now just 200,000 remain.'<sup>38</sup>

'Fossil fuels are the basis of industrial agriculture: oil is feedstock for herbicides and pesticides.'<sup>39</sup>

**'The use of fossil fuel energy for nitrogen fertiliser accounts for 37% of the total energy used by UK agriculture and its price tracks the price of natural gas. UK nitrogen fertiliser prices are rising significantly and are the highest they have ever been.**

Organic farming is more energy efficient. Detailed life-cycle studies for the UK Government show that, on average, organic farming requires about 15% less energy to produce the same amount of food. Typically organic farming is around 30% more energy efficient, but is less energy efficient for poultry and glasshouse vegetables. However, higher costs of living could mean a fall in the sales of organic food.'<sup>40</sup>

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<sup>34</sup> <http://www.lifeaftertheoilcrash.net/>

<sup>35</sup> [http://www.intnet.mu/iels/PO\\_consequences.htm](http://www.intnet.mu/iels/PO_consequences.htm)

<sup>36</sup> <http://www.communitysolution.org/problem.html#12>

<sup>37</sup> <http://www.ers.usda.gov/AmberWaves/April06/Features/Energy.htm>

<sup>38</sup> New Internationalist, *No-dig for victory*, no.402, July 2007 p.12.

<sup>39</sup> <http://www.communitysolution.org/ppts/GreatestChallenge.ppt>

<sup>40</sup> <http://www.soilassociation.org/web/sa/saweb.nsf/89d058cc4dbeb16d80256a73005a2866/cccdcd1cb99f29c8802571960051175e?OpenDocument>

'Overall, fertilisers are the largest source of carbon dioxide emissions in agriculture and the single largest source of nitrous oxide emissions for all sectors in the world.'<sup>41</sup>

'...on the medium term, even fishing activities will have to decline. Furthermore, coastal fisheries that feed coastal communities mainly will have greater difficulties in sustaining their fishing activity, it will impact on their economic well being and even their health as an excellent source of protein (fish) may become deficient.'<sup>42</sup>

'Even more than other oil-driven sectors of the global economy, food production is showing signs of strain as it struggles to maintain productivity in the face of rising population, flattening oil production and the depletion of essential resources such as soil fertility and fresh water.'<sup>43</sup>

According to the Soil Association, Peak Oil will mean;

- A rise in agricultural input prices, so reduced use of fertilisers and other inputs.
- More organic farming, because of greater comparative economic viability and greater interest in non-fertiliser based production. At some stage, organic food could become cheaper than non-organic which would significantly increase sales.
- More composting and use of sewage sludge, as alternatives to N fertiliser.
- Rises in the cost of food processing and packaging (especially plastic), should lead to less processed food and reduced viability of supermarkets and more whole food (though food companies could react by investing in renewable energy).
- Less imported food especially less air freight, so there will be more local food.
- Economic pressure on the intensive indoor livestock sector from increases in the cost of electricity, so there will be more outdoor rearing (and/or rise in use of anaerobic digestion).
- Reversal of the trend towards ever larger and more centralised industries and multi-nationals, because of higher transport costs and an increasing need to secure local energy and other resource supplies. Therefore, more localised economies.
- Greater interest in individual, community and national food self-sufficiency, i.e. allotments, Community Supported Agriculture, direct sales, forward contracts.
- A rise in individual and company energy conservation and self-sufficiency measures, i.e. wind turbines, solar panels, local biomass, CHP etc.
- Less use of machinery and rise in the value of human labour (possible rise in interest in horse-power).<sup>44</sup>

On a local level this will mean:

- Agriculture will have a large and important role to play in the post-Peak Oil economy.
- Farming will have to adapt to low intensive methods, with few or no fertilisers and pesticides. Many farms will become organic in the short-term with the majority, if not the entirety, turning to organic methods in the long-term.

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<sup>41</sup> <http://www.soilassociation.org/web/sa/saweb.nsf/848d689047cb466780256a6b00298980/d2b3a314a06b799780256fc70039d5ac?OpenDocument>

<sup>42</sup> [http://www.intnet.mu/iels/PO\\_consequences.htm](http://www.intnet.mu/iels/PO_consequences.htm)

<sup>43</sup> <http://canada.theoil drum.com/node/2516>

<sup>44</sup> <http://www.soilassociation.org/web/sa/saweb.nsf/89d058cc4dbeb16d80256a73005a2866/cccdcd1cb99f29c8802571960051175e?OpenDocument>

For a similar analysis on the impact of climate change on agriculture and visa versa, and the role organic farming could play, see this link:

<http://www.soilassociation.org/web/sa/saweb.nsf/848d689047cb466780256a6b00298980/d2b3a314a06b799780256fc70039d5ac?OpenDocument>

- However, traditional resistance to change will have an impact on the farming community's ability to act. Many farmers will look to continue their intensive farming methods for as long as possible.
- The debt burden of farms will similarly make it more difficult for farmers to adapt, especially in the short term. The move to organic farming especially can be very costly.
- Many farmers will consider biofuel production. This is likely to be unsustainable in the long-term as biofuel production comes into conflict with land for food production.
- Food will be less easily transportable due to rising fuel and storage costs. There will be an increasing move towards local production and sale.
- The need to produce locally and less energy intensively will lead to diets based more on seasonal fruit and vegetables and new methods of cooking as processed foods are phased out. As has happened in Cuba, this will lead to malnutrition in the short-term then improved nutrition and a healthier diet in the long-term as people adjust and grow their own vegetables.
- People will become more involved in allotments and community gardens, increasing the feeling of community in rural areas.
- As increased numbers of farmers turn to organic due to increased costs in intensive farming methods, the short-term effect is likely to be a decrease in the cost of organic food. However, rising fuel costs will be reflected in the price of food in the long-term.
- Cornwall is likely to be vulnerable to food shortages in the short-term due to its ageing population. The lack of young people available to provide human labour within agriculture as an alternative to traditional farm machinery is likely to put an added strain on the local production of fruit and vegetables.
- There will likely be a larger emphasis on exchange and sharing of food and services within communities rather than a reliance on an unstable currency and uncertain food imports.

It would be possible to become self-sufficient as far as food is concerned. During World War II the US grew something like 40% of its vegetables and fruits in backyard gardens.<sup>45</sup>

Community responses should include:

- Changing people's attitudes towards local and sustainably sourced food.
- Encouraging people's involvement in allotments and community gardens, and holding workshops to teach those who wish to learn how to create compost heaps, sow seeds etc.
- Setting up local cooperatives and encouraging the establishment of local farmers markets.
- Talking to farmers about the likely long-term impracticalities of intensive farming, and discussing the pros and cons of investment in biofuel production.
- Setting up support networks and discussion groups for local farmers.

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<sup>45</sup>[http://www.soilassociation.org/web/sa/saweb.nsf/\(UNID\)/B0C3508DB2E6E5C88025726F0070C84F?OpenDocument](http://www.soilassociation.org/web/sa/saweb.nsf/(UNID)/B0C3508DB2E6E5C88025726F0070C84F?OpenDocument)

### 3.7 Tourism:

#### *Visitor numbers to Cornwall and the Isles of Scilly:*

2002: 5.5 million domestic visitors, 0.2 million overseas visitors.

2003: 4.9 million domestic visitors, 0.2 million overseas visitors.

2004: no data

2005: 4.1 million domestic visitors, 0.3 million overseas visitors.<sup>46</sup>

The oil shocks from 1979 and 1990 reinforced the economic impacts on international tourism. The oil price rose dramatically then slowly decreased over time. Each time, the increase in oil price did not have a direct impact on international tourism revenue. The indirect impact was felt in each case as economic growth rates faltered through inflationary effect of energy prices. There was slow or negative growth in international tourism.<sup>47</sup>

'...a tourism economy without a sustainable transport policy and system means less tourism in the long-term.'<sup>48</sup>

'Over the next ten years, the consumer will become conditioned so that ecological behaviour is the norm...Normal behaviour will be sorting out rubbish for recycling, using public transport instead of the car where possible and other energy efficient measures. This means tourism destinations must champion, develop and action green tourism policies.' This will include free public transport for all.<sup>49</sup>

'For destinations that rely totally on international air travel it might...be wise to consider (re)investing into domestic tourism, including the development of fossil free transport systems.'<sup>50</sup>

'The total reliance of the airline and tourism industry on oil means this industry will probably be the first to be affected. Already, high oil prices are causing fuel surcharges on air tickets and in the US a number of airlines are close to bankruptcy. Over time, international air travel and tourism will be restricted to the rich and powerful. Mass tourism will decline into extinction. The economic consequences of this decline will be severe for many countries.'<sup>51</sup>

'The rise in oil prices and the inevitable event of global oil production peak will affect the recreation and leisure services field severely...Retail and the recreation and leisure services industries will have to become much more locally based. Oil is necessary to keep these industries profitable and available.'<sup>52</sup>

#### On a local level this will mean:

- Cornwall's economy being heavily reliant on tourism, it will be hard hit by economic recession in the long-term, with less people being able to afford holidays. However, in the short-term economic recession will mean that UK visitors head to Cornwall rather than abroad as the latter will become much more expensive. In the long-term inflation will see the near cessation of long-distance holidays, whether abroad or within the UK.
- In the short-term, the further the tourist has to travel, the greater the impact will be. Air travel will be the first transport sector to be affected, both long and short

<sup>46</sup> <http://www.cornwalltouristboard.co.uk/documents/TourisminCornwallResearchUpdateSep06.pdf>

<sup>47</sup> [http://www.scotexchange.net/tomorrow\\_s\\_news-sheet\\_180506.pdf](http://www.scotexchange.net/tomorrow_s_news-sheet_180506.pdf) p.3

<sup>48</sup> [http://www.scotexchange.net/tomorrow\\_s\\_news-sheet\\_180506.pdf](http://www.scotexchange.net/tomorrow_s_news-sheet_180506.pdf) p.12

<sup>49</sup> [http://www.scotexchange.net/tomorrow\\_s\\_news-sheet\\_180506.pdf](http://www.scotexchange.net/tomorrow_s_news-sheet_180506.pdf) p.13

<sup>50</sup> [http://www.lincoln.ac.nz/story\\_images/2839\\_Peakoil\\_s8409.pdf](http://www.lincoln.ac.nz/story_images/2839_Peakoil_s8409.pdf) *Managing Tourism in the Face of Peak Oil*, p.22.

<sup>51</sup> [http://www.intnet.mu/iels/PO\\_consequences.htm](http://www.intnet.mu/iels/PO_consequences.htm)

<sup>52</sup> <http://www.progressiveu.org/113811-the-global-oil-production-peak-and-its-effects-on-the-field-of-recreation-and-leisure-services>

distance, as the real cost of fuel becomes reflected in ticket prices. Car travel will be affected by varying degrees depending on how far the passenger/s is/are travelling. Given that the majority of Cornwall's visitors arrive from within the UK (see the figures above), the short-term impact of rising fuel costs will only have a limited impact on visitors to Cornwall. Similarly, more Cornish families will choose to remain in Cornwall for their holidays. In the long-term however, as people travel less and less, the economic impacts are likely to be much more severe as people gradually stop taking holidays away from their local area.

- The impact of climate change on the tourist industry will similarly need to be taken into account, as wetter summers will dissuade visitors from coming to Cornwall. This will complicate the effect that Peak Oil will have on the tourist industry. Tourists will not wish to spend increasing amounts of money to travel to Cornwall only to end up spending their holiday in the rain.

Community responses should include:

- The creation of efficient public transport systems. As fuel costs increase, arriving by air or car will become too expensive and rail travel is likely to increase. This latter means of transport, being the most energy efficient, is likely to become more widely used as rising fuel costs will be increasingly reflected in the price of the most inefficient transport, such as air and road travel. Tourists will rely more heavily on public transport once in Cornwall as they will be less likely to arrive by car.
- Local councils will similarly need to provide people with the infrastructure, such as recycling bins, which will encourage environmentally friendly behaviour.

### **3.8 Health Services:**

'Modern health care is dependent on sophisticated computer technology and expensive diagnostic machinery that require large inputs of energy derived from carbon-based fossil fuels. Our health systems are further dependent on a wide range of products such as pharmaceuticals, all of which derive from petroleum.'<sup>53</sup>

'Petrochemicals are used to manufacture analgesics, antihistamines, antibiotics, antibacterials, rectal suppositories, cough syrups, lubricants, creams, ointments, salves, and many gels. Processed plastics made with oil are used in heart valves and other esoteric medical equipment. Petrochemicals are used in radiological dyes and films, intravenous tubing, syringes, and oxygen masks...'<sup>54</sup>

'It is particularly likely that ethical dilemmas will arise during the redesign of the healthcare system as a response to peak oil. This is because there will be a conflict between what is best for society as a whole, versus what is best for the individual.'<sup>55</sup>

'If communities are alone (which actually may be a realistic scenario for a peak oil long emergency), the impact on local public health and social services systems could be devastating and those most vulnerable become especially at risk for being abandoned. Who are those vulnerable and marginalized? Low income populations – whose numbers will grow – will be the first and hardest hit by Peak Oil; those already stigmatized racial and ethnic groups; the growing number of elderly in our society who will require an increasing amount of medical care; those with chronic illnesses

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<sup>53</sup> <http://www.transition-health.com/> Dr Pamela Gray is writing a book on this subject which is due for publication in 2007.

<sup>54</sup> <http://www.orionmagazine.org/index.php/articles/article/314>

<sup>55</sup> <http://peakoilmedicine.com/category/general-practice/>

(currently 7 percent of the population has diabetes, 12 percent heart disease);<sup>56</sup> and those who are disabled.<sup>57</sup>

'The commonsensical...[post Peak Oil healthcare] model will emphasize public health—the prevention of disease and the promotion of health within the population as a whole—over treatment medicine, which focuses on restoring health to chronically or acutely ill individuals.'<sup>58</sup>

'...each individual will need to take more responsibility for their own body, and try to be as healthy as possible. There will need to be a change in focus from the treatment of disease to the promotion of wellness...it will be important to enlist the whole community in achieving good health, and the current boundaries that separate medical workers from the general public will become blurred.'<sup>59</sup>

Learning from past experiences:

*The protest against rising oil prices in September 2000 saw a blockade by fishermen, farmers and truck drivers that provoked an eight day fuel shortage across Britain:*

'One of the most severely affected sectors was health care. Although an attempt was made to provide preferential fuel supplies for health care workers, it was not widely successful. The crisis was generally worse in remote and country areas that were heavily dependent on transport. Media reports from the time documented the problems, including:

- Inability to discharge patients because their relations couldn't travel to the hospital to pick them up.
- Closure of outpatients departments.
- Severe shortages of blood products, drugs, sutures and linen.
- Cancellation of all elective and non-emergency surgery.
- Shortages of hospital staff because they couldn't get to work.
- Severe limitation of ambulance travel, with activity limited to emergency calls only.
- Inability of community nurses, general practitioners and other community-based workers to visit their patients. One GP was planning to do home visits on horseback when the petrol ran out.
- Accumulation of contaminated waste because it couldn't be collected.'<sup>60</sup>

What can we learn from 1918?:

'As there were no antibiotics or antivirals available in 1918, the crux of infection control was breaking the train of transmission through quarantine, isolation and reducing overcrowding. A secondary strategy was to give patients the best known supportive care (including rest, optimal nutrition, fresh air and sunlight). Not only is such an approach demonstrably effective, it is also low-tech, cheap, and able to be used everywhere an outbreak occurs. It may also be the last best option for managing multi-resistant TB, HIV, MRSA and other "superbugs".'<sup>61</sup>

On a local level this will mean:

- There will be pressure on the government to maintain an effective health service. In the short-term, this is likely to lead to a move towards a centralised healthcare

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<sup>56</sup> These figures relate to the US.

<sup>57</sup> <http://postcarboncities.net/node/127>

<sup>58</sup> <http://www.orionmagazine.org/index.php/articles/article/314>

<sup>59</sup> <http://peakoilmedicine.com/category/general-practice/>

<sup>60</sup> <http://peakoilmedicine.com/2006/08/27/demonstration-of-the-vulnerability-of-the-health-care-system-to-fuel-supply-disruption/>

<sup>61</sup> <http://peakoilmedicine.com/category/public-health/>

system in order to reduce costs. Due to a rise in transport costs, this will conflict with the public's need for a decentralised system.

- Expensive specialist treatment may become too expensive to be economically viable. Only the more serious cases will receive treatment in the long-term.
- In many cases, people will find that they will have to take more personal responsibility for the well-being of their family, especially the elderly members who will be less likely to receive high levels of healthcare than the younger generations.
- Surgeries and hospitals will become less and less able to prescribe drugs and medicines to those in need.

Community responses should include:

- Workshops should be held to teach people about the general rules of first aid. Health and hygiene classes should similarly be encouraged, as should classes promoting general well-being and fitness.
- Local support networks should be set up with emergency contact numbers for people with medical training in the local area.
- People should be informed of the consequences of Peak Oil for the healthcare system and encouraged only to call on their services in serious circumstances to help alleviate pressure on the system.
- Local councils should provide free public transport systems to local GPs and hospitals.

### **3.9 Population and migration:**

'Today, climate scientists are warning of mass migrations related to the effects of global warming. In addition, the possibility of the first peak oil driven mass migration - in this case out of Mexico and into the United States - is starting to get some attention as well.'<sup>62</sup>

On a local level this will mean:

- As a mild, fertile region Cornwall is likely to see an increase in its population density. The food shortages that will come about as a result of Peak Oil will force many to leave the cities for smaller towns and villages, drastically altering the dynamics of local communities.
- In the short-term, arrivals are likely to come from overseas, as developing countries that are reliant on oil yet unable to pay rising oil prices will be the first to suffer. People from under-developed countries which are less dependant on oil are unlikely to migrate in such large numbers due to a lack of economic viability and their tendency to be more self-sufficient. However, as fuel prices road and air transport out of reach and UK cities become increasingly deprived of a reliable food supply, many people within the UK will look to move into more rural areas. Whereas in the long-term there will be fewer migrants arriving from overseas, population movement from the city to the town or village is likely to be very substantial.
- Large numbers of arrivals, whether from overseas or elsewhere in the UK, will doubtless put pressure on the ability of rural communities to provide sufficient food for their populations.

Community responses should include:

- Local communities looking into energy efficient means of food transport, such as opening up old rail tracks as mentioned above, which would facilitate the supply of food from the country to the town in the long run.

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<sup>62</sup> <http://www.energybulletin.net/28128.html>

- Local populations being prepared for an influx of new arrivals in advance and discussing ways to avoid racial tensions towards immigrant populations.
- As aforementioned, developing community allotments and encouraging food self-sufficiency to ease the strain on food supply as people begin to depend increasingly on local produce.

## ***Sink or Swim?*** **The Cuban Case Study.**

### **1.0 The Scenario:**

Cuba had an artificial Peak Oil scenario imposed on it in the 1990s, so providing a prime example of what *could* happen in a post oil dependent world.

'What really caused Cubans' living standards to plummet was the collapse in 1991 of the Soviet Union, which had bankrolled the country's inefficient economy as a means of irritating Washington.

The end of the Cold War brought a halt to plentiful supplies of cheap crude oil in exchange for Cuban sugar, as Russian President Boris Yeltsin served notice that he was pulling the plug on Soviet subsidies.<sup>63</sup>

'As a result of the collapse of the Soviet Union and the subsequent retraction of petroleum, farm equipment, food subsidies, and the preferential trade relationship that had come with Soviet support of the Cuban state, the country lapsed into a phase of dire food, energy, and morale shortages, known as the "Special Period" or "periodo especial".<sup>64</sup>

- Land had been taken up with sugar and tobacco plantations, however following 1989 Cuba stopped receiving subsidies for these plantations.
- The US trade embargo was tightened 1992-6.

Prior to the collapse of the Soviet Union, 70% of Cuba's oil had been used in transport.<sup>65</sup>

Following the fall of the Soviet Union, oil imports to Cuba dropped from 13-14 million tons a year to only 4 million.<sup>66</sup> GDP dropped by 1/3, the average calorie intake dropped by 1/3 and problems of malnutrition and depression followed.<sup>67</sup> The average Cuban had lost 20lbs in weight by 1994.<sup>68</sup>

### **2.0 The Government's Role:**

The speed at which oil shortages affected Cuba meant that the government had little power over what was happening within the country. It gave more responsibility to

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<sup>63</sup> <http://news.bbc.co.uk/1/hi/business/6189319.stm>

<sup>64</sup> [http://www.organicconsumers.org/organic/cuba\\_organic\\_food.cfm](http://www.organicconsumers.org/organic/cuba_organic_food.cfm)

<sup>65</sup> <http://www.youtube.com/watch?v=f7i6roVB5MI&mode=related&search> Peak Oil Television:

*Leaning from Cuba's Response to Peak Oil*: Interview with Megan Quinn, Outreach Director from The Community Solution.

<sup>66</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>67</sup> <http://www.youtube.com/watch?v=f7i6roVB5MI&mode=related&search> Peak Oil Television:

*Leaning from Cuba's Response to Peak Oil*: Interview with Megan Quinn, Outreach Director from The Community Solution.

<sup>68</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

local government which led to grass roots movements. The government then helped these movements along, for example by giving out energy efficient appliances.<sup>69</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

- We need to develop grass roots projects at a community level to empower local communities and get them used to working together.
- Government may have little influence over what happens on a local level as the effects of Peak Oil set in. Local communities should therefore be helped for the onset of Peak Oil through the provision of models in the form of small scale community projects emphasising self-sufficiency.
- Small scale projects within local communities (such as vegetable allotments, permaculture projects, the establishment of cooperatives and local exchange of fresh fruit and vegetables) could act as models for larger such developments in the future.

### 3.0 Farming:

Cuba's pre-1990 levels of fertiliser per acre exceeded those of the US.<sup>70</sup> However, a lack of oil for intensive agriculture saw Cubans take the 'sustainable path'; 85% of all agriculture is now organic.<sup>71</sup>

'The 21st century will, I think, almost certainly see...the trend of re-ruralisation, because we will need lots more people engaged in food production. The Cuban experience was that they found they needed something like 15-25% of their population involved in food production, growing food in urban gardens, moving from the cities back to the countryside to work at producing food. If that same percentage holds for other industrialised nations, then extrapolated to the UK we're talking about something like a minimum of 10 million new farmers needed over the next 20 to 30 years.'<sup>72</sup>

'Key ingredients in the new agricultural model are the urban agriculture movement; traditional farming techniques like composting and intercropping (growing two crops together that benefit each other by warding off particular pests); new non toxic biopesticides and biofertilizers; worker-managed collectives; quotas for farmers to insure adequate supply for the whole country; and opening farmers' markets where excess food crops can be sold by farmers for profit...

The government also addressed land availability for domestic food production by redistributing parcels of land that had formerly operated as cane plantations for the sugar industry...

Cuba is at the vanguard of the global urban agriculture movement. In 2002, Cuba produced 3.2 million tons of food in urban farms and gardens. In 2002, more than 35,000 hectares (86,450 acres) of urban land were dedicated to the intensive production of fresh fruits, vegetables, and spices.<sup>73</sup>

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<sup>69</sup> <http://www.youtube.com/watch?v=f7i6roVB5MI&mode=related&search> Peak Oil Television: *Learning from Cuba's Response to Peak Oil*: Interview with Megan Quinn, Outreach Director from The Community Solution.

<sup>70</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>71</sup> <http://www.youtube.com/watch?v=f7i6roVB5MI&mode=related&search> Peak Oil Television: *Learning from Cuba's Response to Peak Oil*: Interview with Megan Quinn, Outreach Director from The Community Solution.

<sup>72</sup> [http://www.soilassociation.org/web/sa/saweb.nsf/\(UNID\)/B0C3508DB2E6E5C88025726F0070C84F?OpenDocument](http://www.soilassociation.org/web/sa/saweb.nsf/(UNID)/B0C3508DB2E6E5C88025726F0070C84F?OpenDocument)

<sup>73</sup> [http://www.organicconsumers.org/organic/cuba\\_organic\\_food.cfm](http://www.organicconsumers.org/organic/cuba_organic_food.cfm)

Farmers in Cuba are now amongst the most respected members of the community, gaining a higher wage than either engineers or scientists.<sup>74</sup>

Much work has been done to rebuild the soil. Crop interplanting reduces the need for pesticides and less effort is needed once the system is established, the idea being that farmers are working *with* nature rather than against it.

- The use of oxen instead of tractors doesn't compact the soil.
- Cooperatives train people in working oxen.<sup>75</sup>

The development of cooperatives:

- A highly autonomous development.
- Land is leased to individuals rent free.
- People leasing the land must use it for growing food or it will be returned to the government.
- The co-ops often invest as a group, saving money by buying machinery together etc.<sup>76</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

- Local communities could identify disused land that could be developed and turned into community gardens producing fruit and vegetables, with an emphasis on redeveloping the soil and making the area as productive as possible with minimum 'oil' input (i.e. oil based products such as pesticides, or machinery).
- Information sessions should be held first to explain Peak Oil, the impacts, and the importance of community based projects. People could offer their own suggestions as to how the area (or indeed which area) could be used.
- There is a need for re-training of farmers on a local level. Identifying people in local communities that have such skills at this point and helping them to expand these skills, plus holding training workshops for others who wish to learn this skills now, will mean that each community has the knowledge they need to produce food sustainably. Those who have been trained should then be able to pass such information and knowledge on to others who need it, when the time comes.
- There is a need for models so that communities have somewhere to look to when the effects of oil depletion begin to be felt (look at the 'End of Suburbia' video and the example of the New Urbanism project). Small scale local projects could achieve this, and the establishment of cooperatives and local farmers markets would create an effective preparatory network for a post oil dependent community.
- Public awareness is vital for support of a turn to low intensive farming methods.
- Cornwall does have a mild, wet climate and the potential to provide large supplies of fruit and vegetables. This may not, however, be the same for other rural communities.
- If vegetable allotment schemes were to become widespread, networking at a local level would help to locate other communities whose geographical location may be preventing them from producing as much food (i.e. those living near the sea where windy weather may prevent such rich crop yields). At a time of food shortage, other communities needing support would be easily identifiable. The same goes for identifying people within the community who may be less able to provide for themselves (such as the more elderly members).

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<sup>74</sup> <http://www.youtube.com/watch?v=f7i6roVB5MI&mode=related&search> Peak Oil Television: *Leaning from Cuba's Response to Peak Oil*: Interview with Megan Quinn, Outreach Director from The Community Solution.

<sup>75</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>76</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

#### 4.0 Food Security:

Following the fall of the Soviet Union not only was there a shortage in food production in Cuba, people were unable to store food as there was no energy to run fridges. Water supply was similarly affected, and water had to be hauled up buildings on pulleys.<sup>77</sup>

During the first 5 years of the energy crisis when food imports were reduced by 80%, government food distributions prevented hoarding.<sup>78</sup>

'After 10 years of hard work and major food shortages, most Cubans can feel secure in having access to fresh, nutritious food through the extensive network of intensively cultivated urban gardens, or *organoponicos*, and state-run farms and cooperatives outside the cities. They can also take comfort in the fact that nearly all the food they eat comes from a self-sufficient agricultural system that relies only minimally on pesticides, fertilizers, or expensive machinery.'<sup>79</sup>

'Cuba does not have the transport infrastructure - especially since the Soviets stopped delivering fuel - to deliver large quantities of food from rural areas to the cities on a regular basis. This means that urban residents benefit not only from feeding themselves but also by guaranteeing the freshness of their daily sustenance...

Extra food is shared in the community. Retirement home and hospital kitchens receive anywhere from a steady supply to seasonal, fluctuating donations from neighbourhood gardens. These gardens, coupled with the comprehensive rural and suburban farms, play a critical role in completing the sense of food security that Cubans now enjoy.

- Focus on organic, permaculture and energy from renewable sources such as solar power.
- Improvements in diet have led to improvements in health.'<sup>80</sup>

Whereas calorie intake has now returned to its pre-1990s level, the food eaten is now healthier.<sup>81</sup>

There is now a greater sense of community, with exchange taking place on a local level.<sup>82</sup>

People now grow much of their food in the cities...and anywhere they can! They identified idle plots of land and transformed them into vegetable gardens with the help of agricultural experts who arrived to give training and advice. There are now many rooftop gardens and permaculture is a widely used method. Cooperation between communities is widely encouraged.<sup>83</sup>

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<sup>77</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>78</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>79</sup> [http://www.organicconsumers.org/organic/cuba\\_organic\\_food.cfm](http://www.organicconsumers.org/organic/cuba_organic_food.cfm)

<sup>80</sup> [http://www.organicconsumers.org/organic/cuba\\_organic\\_food.cfm](http://www.organicconsumers.org/organic/cuba_organic_food.cfm)

<sup>81</sup> <http://www.youtube.com/watch?v=f7i6roVB5MI&mode=related&search> Peak Oil Television:

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<sup>82</sup> <http://www.youtube.com/watch?v=f7i6roVB5MI&mode=related&search> Peak Oil Television:

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Kiosks within the city provide fresh fruit and vegetables, with over 50% of Havana's vegetables being supplied by urban agriculture. Smaller villages and towns provide 80-100% of the fruit and vegetables they need.<sup>84</sup>

Local food production has created jobs.<sup>85</sup>

Many vegetable gardens supply schools and the elderly with fruit and vegetables free of charge.<sup>86</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

- Local farmers markets could be set up in small towns and villages where they do not already exist to sell food produced in community allotments. Money raised could then be put into further community projects.
- The emphasis needs to be on sharing to avoid conflict and hoarding during potential food shortages.
- Projects in local communities could include those promoting renewable energy.
- The emphasis on local does not have to be solely through the idea of sustainable food (or energy) production. Other local events such as video showings, discussion evenings or training workshops in other areas such as arts and crafts would similarly help create a sense of community.
- An emphasis on local, and predominantly organic, food production will also help in tackling CO2 emissions and climate change.

## 5.0 Transport:

During the years that followed the oil crisis, Cubans would regularly have to wait 3 or 4 hours to catch a bus to work. Once at work, there would be no electricity and so there was nothing to do.<sup>87</sup>

'The country was forced to come up with some creative solutions to its problems, including the creation of the two-humped "camel" buses - immense tractor-trailers that can carry a couple of hundred people.'<sup>88</sup>

Many people hitchhike, and government vehicles are required to pick up hitchhikers. Many inhabitants from small towns turned to horses and mules as alternative forms of transport.<sup>89</sup>

The government also imported bicycles to help alleviate the transport crisis.<sup>90</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

- Local communities should be asking themselves what alternative transport opportunities are there in the local area. Is there a disused rail track that the local government could be lobbied into investing in? Or could a cycle route campaign be started up?

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<sup>84</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>85</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>86</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>87</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>88</sup> <http://news.bbc.co.uk/1/hi/business/6189319.stm>

<sup>89</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>90</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

- Local community meetings could promote car sharing, and car share schemes could be set up within the local community. These would also, as above, help fight CO2 emissions that cause climate change.

## 6.0 Health:

Cuban doctors often live in the neighbourhood where they work.<sup>91</sup>

During the crisis, the government kept providing health care free of charge.

- The average life span and infant mortality rates have remained equal to those of the US, despite the fact that Cubans consume only 1/8<sup>th</sup> of the energy of the average American.<sup>92</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

- This is a difficult area to tackle without the support of national government. However, local training workshops could include sessions on care in the community, or first aid training courses.

## 7.0 Education:

Decentralised education systems were put into place: people have to travel less. During the crisis, the government kept providing education free of charge.<sup>93</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

- Children should be encouraged to get involved with community projects at every level
- Local schools could be encouraged to introduce oil depletion as part of their syllabus.

## 8.0 The Economy:

'Because of the terms of the trade sanctions, Cuba has been ineligible to receive food aid from international aid agencies.'<sup>94</sup>

Money lost its value.<sup>95</sup>

There was an initial depression in Cuba that was reminiscent of war times.<sup>96</sup> 1980s farming had been based on intensive monoculture methods. Following the cut off of subsidies, Cuban farmers were unable to afford the large amounts of chemicals needed to continue such intensive farming, and so looked to other methods.<sup>97</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

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<sup>91</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>92</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>93</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>94</sup> [http://www.organicconsumers.org/organic/cuba\\_organic\\_food.cfm](http://www.organicconsumers.org/organic/cuba_organic_food.cfm)

<sup>95</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>96</sup> [http://www.organicconsumers.org/organic/cuba\\_organic\\_food.cfm](http://www.organicconsumers.org/organic/cuba_organic_food.cfm)

<sup>97</sup> [http://www.organicconsumers.org/organic/cuba\\_organic\\_food.cfm](http://www.organicconsumers.org/organic/cuba_organic_food.cfm)

- As above, there should be an emphasis on the *exchange* of goods or services within the community.
- Similarly, we need an active, independent media who will emphasise the need to step away from a consumer based society. Could local newspapers be set up to this effect? (Many regional ones do already exist).

## 9.0 Housing:

The scarcity of tools has meant that it is very difficult to build new housing in Cuba. Oil is needed not only for transportation costs, but in the provision of cement and other tools.<sup>98</sup>

People tend to live in small houses, often in large (family) groups.<sup>99</sup>

New amenities have been set up near to people's homes, with new housing designs emphasising the provision of space (i.e. for urban gardens).<sup>100</sup>

Rural schools are supplied with solar panels rather than connected to the national grid.<sup>101</sup>

What are the messages for Cornwall/what should (our) local communities be encouraged to do?

- Again, this particular issue is more difficult to address on a local, community level. Projects to build sustainable housing on a small scale (for example an outdoor community theatre or a garden shed for allotments) could be carried out with an emphasis on the use of local and/or recycled materials from the surrounding area. This could then act as a model for future large scale projects.

For more information on the Cuban response to Peak Oil, take a look at The Community Solution's very informative PowerPoint presentation:  
<http://www.communitysolution.org/ppts/Low-EnergyCuba.ppt#496>

## The Peak Oil Think Tanks

**Alliance for a Post-Petroleum Local Economy (APPLE):**

<http://www.apple-nc.org/index.php>

**Association for the Study of Peak Oil and Gas (ASPO):**

<http://www.peakoil.net/>

**Peak Oil: Life After the Oil Crash:**

<http://www.lifeaftertheoilcrash.net/>

This website comes across pessimistic scaremongering...once you get past that it's actually quite informative and the sources seem respectable although often biased. However, it does provide many statistics etc and links to further websites.

**Peak Oil Medicine:**

<http://peakoilmedicine.com/category/general-practice/>

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<sup>98</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

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<sup>100</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>101</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

**Powerswitch:**

<http://www.powerswitch.org.uk/>

Very useful links and summaries of large documents on Peak Oil.

**The Community Solution:**

<http://www.communitysolution.org/>

A very informative website. Although the site focuses mainly on Peak Oil, the group does look at Peak Oil and Climate Change together. In assessing the implications of Peak Oil on a local scale, the programme is acutely aware of the combined impact of global warming and oil depletion. The result is informed solutions that do not attempt to offer means in which we may continue with uncurbed economic growth (such as renewable energy solutions or other fossil fuels), instead aiming to reduce growth through sustainable community projects.

**The Energy Bulletin:**

<http://www.energybulletin.net/23151.html>

**The International Energy Agency (IEA):**

<http://online.wsj.com/public/resources/documents/iea20070707.pdf>

Their *Mid-Term Oil Market Report*, July 2007, can be found via this link. A very useful source that predicts what will happen to oil demand and supply and sees an oil 'crunch' approaching around 2012.

**The Oil Depletion Analysis Centre (ODAC):**

<http://www.odac-info.org/>

Has links to current articles on Peak Oil and Climate Change. A well organised website!

**The Oil Drum:**

<http://www.theoil Drum.com/>

A forum and informative site on Peak Oil, with regular updates.

**The Post Carbon Institute:**

<http://www.postcarbon.org/>

Their Post Carbon Cities Guidebook looks at the role of local governments after Peak Oil:

<http://postcarboncities.net/guidebook>

**The Soil Association:**

<http://www.soilassociation.org/>

Gives a good outline of the implications of Peak Oil for food supply and farmers. See these links especially:

<http://www.soilassociation.org/web/sa/saweb.nsf/89d058cc4dbeb16d80256a73005a2866/cccdcd1cb99f29c8802571960051175e?OpenDocument>

<http://www.soilassociation.org/conference> is the conference on preparing for a post peak oil food and farming future.

**Transition Cornwall:**

<http://www.transitioncornwall.com/>

A very informative website on how rural communities in Cornwall should make the transition to low carbon living. Information on upcoming events in Cornwall, and other transition movements across the UK.

Definitely worth a look: Robert Hirsch, *Peaking of World Oil Production: Impacts, Mitigation and Risk Management*, Feb. 2005. Hirsch assesses three different scenarios: 1) action taken when peaking occurs, 2) action taken 10 years before peaking, and 3) action taken 20 years before peaking:

[http://www.netl.doe.gov/publications/others/pdf/Oil\\_Peaking\\_NETL.pdf](http://www.netl.doe.gov/publications/others/pdf/Oil_Peaking_NETL.pdf)

An overview of the Hirsch/DoE Report can be found here (it's much shorter!):

<http://www.powerswitch.org.uk/portal/index.php?option=content&task=view&id=497&Itemid=2>

However, this report looks to find replacements for oil – compare this analysis to The Community Solution which warns of the environmental consequences of such actions.

## Appendix

Energy required to produce a microchip see:

<http://www.enviroliteracy.org/article.php/1275.html> :

*Computer chips have a high environmental impact relative to their weight. For every gram of a microchip, 630 grams of fossil fuels are used, whereas for every gram of an automobile, only 2 grams of fossil fuels are used.*

*For a 2-gram, 32-megabyte memory chip and its plastic package, about 70.5 pounds of water is used.*

*Computer chips have a high environmental impact relative to their weight. For every gram of a microchip, 630 grams of fossil fuels are used, whereas for every gram of an automobile, only 2 grams of fossil fuels are used. This is due to the fact that making very pure, organized and hence low entropy structures from high entropy materials require large energy inputs.*

*Automobiles, while made with heavy materials, do not require the level of purity and sophistication of materials as a microchip. The energy used in producing nine or ten computers is enough to produce an automobile.*

<http://www.enviroliteracy.org/article.php/1119.html> :

*Consumers use cell phones for an average of 18 months before dispose of them, a much shorter period than the lifecycle of older phones. Between 0.8 and 4 percent of the municipal waste stream in Europe and the US is comprised of consumer electronics. 0.027 percent likely will be from cell phones in 2005, and this is expected to grow. Consumer electronics are responsible for 40 percent of the lead in this stream. Seventy percent of obsolete cell phones are stockpiled in closets and shelves instead of thrown away. Given the ubiquity and short lifetimes of cell phones, it is likely that they do a significant impact on the environment.*

'Oil prices were stable for most of the 100 years before 1973 at well under \$5 a barrel. Expressed in today's dollars (all figures in U.S. dollars), the price was closer to \$10 a barrel, hitting highs of about \$15 and lows close to \$8. Even as the world economy boomed in the decades following the Second World War, prices remained fairly stable. That's mainly because the United States held most of the clout in the oil industry - and the U.S. government regulated the price of oil.

From 1958 to 1970, prices were stable at about \$3 per barrel, but in real terms the price of crude oil declined from above \$15 to below \$12 per barrel. The decline in the price of crude when adjusted for inflation was further exacerbated in 1971 and 1972 by the weakness of the U.S. dollar.

But by the early 1970s, that changed. The Organization of Petroleum Exporting Countries had become a force and in 1973, the first major oil shock hit the world as Arab nations refused to sell to countries that had expressed support for Israel in the Arab-Israeli war of October 1973.

Within a few months, the price of oil went from around \$3 a barrel to about \$12. That sounds like a bargain, compared with just over \$70 in April 2006. But expressed in today's dollars, the price went from around \$10 a barrel to \$40 a barrel. That's a huge increase and the impact on the global economy was devastating.

And prices didn't retreat from that level. By 1979, the world was in for another oil shock as unrest in Iran led to the toppling of the Shah - a friend of the West - and the rule of the ayatollahs.

Oil went from a little less than \$15 a barrel to around \$35. In today's dollars, that's like boosting the price of oil from about \$40 a barrel to \$80.<sup>102</sup>

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<sup>102</sup> <http://www.cbc.ca/news/background/oil/>

**1970s:**

***Oil price rises rose from \$5 to \$40 a barrel (the equivalent of \$70 today) from 1973 to the early 1980s:***

- British drivers had to adhere to strict speed limits on the roads.
- restrictions on heating and use of electricity for outdoor displays were introduced.
- US drivers had to wait in long queues for fuel.
- recession from 1975.<sup>103</sup>

The US suffered an economic crisis, with record high interest rates, a declining stock market, recession etc. Gas purchases and speed limits were both restricted.<sup>104</sup>

Regan had cut investment in renewables following the discovery of oil in Alaska.<sup>105</sup>

**Cuba:**

'People have been subject to food rationing ever since the US economic embargo was imposed in 1962.'<sup>106</sup>

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<sup>103</sup> [http://www.scotexchange.net/tomorrow\\_s\\_newsheet\\_180506.pdf](http://www.scotexchange.net/tomorrow_s_newsheet_180506.pdf) p.3

<sup>104</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>105</sup> *The Power of Community: How Cuba Survived Peak Oil*, produced by The Community Solution.

<sup>106</sup> <http://news.bbc.co.uk/1/hi/business/6189319.stm>