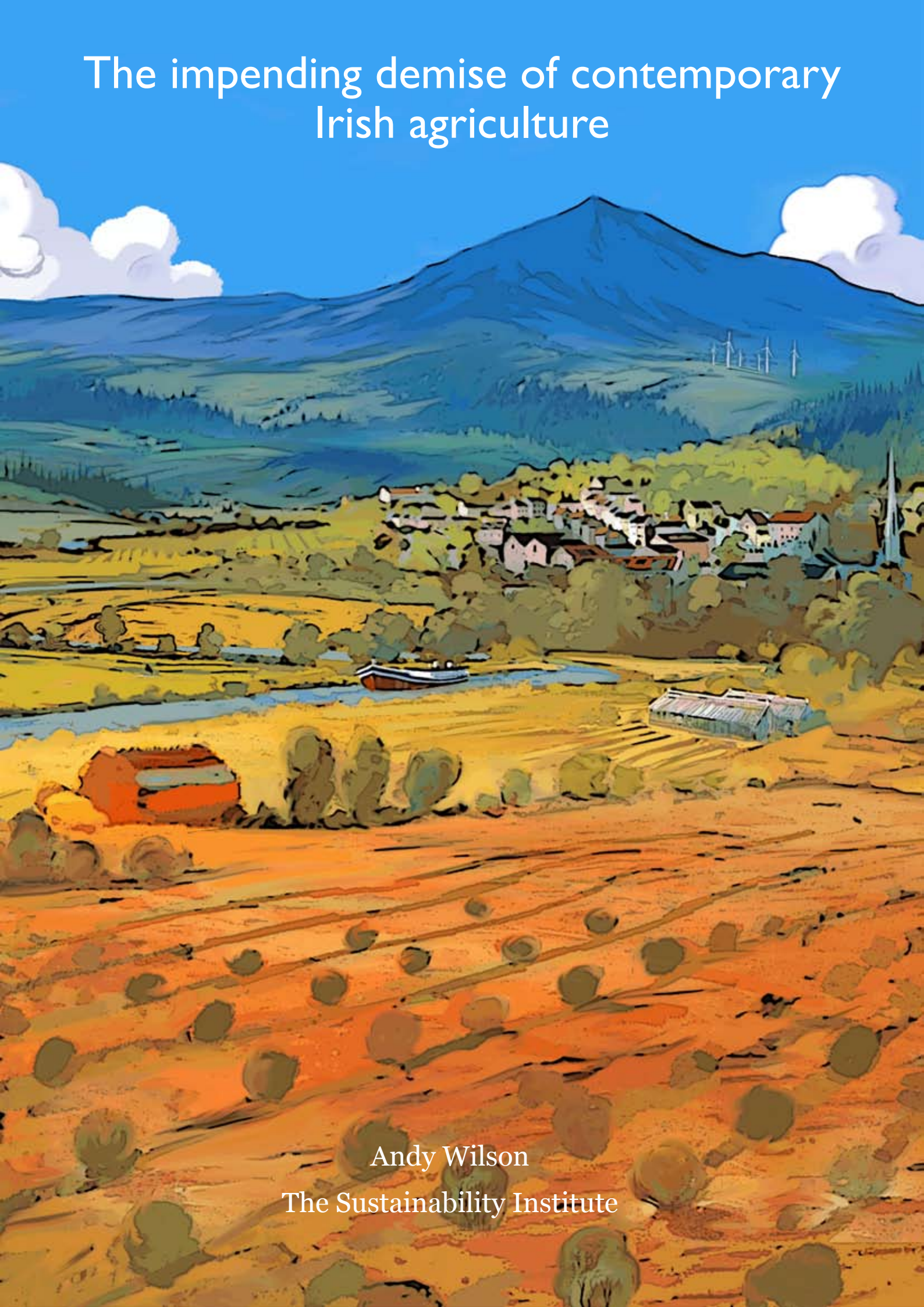
The impending demise of contemporary Irish agriculture



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Irish agriculture is vulnerable to many external factors. At EU level, subsidies may dry up as long term economic recession obliges member states to use limited financial resources to best effect. At an individual level, non-payment of debts may force farmers into bankruptcy. The rising price of gas and oil will be reflected in higher prices of fertilisers and agricultural feedstuffs, and higher transport costs. Climatic factors such as increased precipitation may render contemporary intensive tillage and grazing practices unviable in many parts of the country, adding further pressure to farmers already struggling to replay outstanding loans. Finally, external markets may collapse owing to increased competition from low cost sources in the undeveloped world, or changing dietary habits in recipient countries. In the longer term, falling availability of fossil fuels with eventually lead to a more widespread collapse of global supply chains.

In the past, economic crises in agriculture were typically resolved by cutting wages, even if this meant starvation for agricultural workers. However, contemporary labour costs, including contract work, comprise a relatively small proportion of total production costs. The bulk of costs relate to the purchase of fertilizers, other agro-chemicals and feedstock, and provision of infrastructure and machinery. These costs are often non-negotiable.

While it is unclear which of these often interconnected factors will cause Irish agriculture to fall off the edge of the cliff, it is essentially an accident waiting to happen. In spite of the current production surpluses achieved in meat and dairy products (over domestic demand), Ireland could quickly find itself in a dangerous food deficit situation once excess livestock is consumed.

The food energy value of all crops, animal and dairy outputs suitable for human consumption is around 10,700 billion Calories per annum, slightly over twice Ireland's annual dietary intake. However, as already stated, much of the tillage output is intended for animal feed. Therefore it is wrong to consider the gross figure as a true output, as the animal feed portion is really an input for the beef and dairy sector.

In addition, a significant proportion of the grain crop is used in the industrial production of alcohol. Barley and oats - currently very minor components of the Irish diet but major sources of animal feed - collectively account for over 45 percent of the total agricultural calorific output. The dairy and meat sectors accounts for a further 25-30 percent, though the quantity produced exceeds the current domestic demand by more than a factor of three. The balance of 25-30 percent is made up of other tillage crops, most of which are consumed in Ireland.

Summary of Irish food production (Calories)

Dairy: 2384 billion

Meat and eggs: 480 billion

Grain: 7390 billion (barley and oats c 5000 billion)

Potatoes: 350

Other crops: 150 billion

Total output: c 10,700 billion Calories

Total human food value: ≈5500 billion Calories (balance is animal feed or used for other non-food purposes such as alcohol production)

Total eaten in Ireland: 1600-1900 billion Calories (see p5)

The waste of the land resource

An analysis of livestock and dairy production in Ireland suggests an output of approximately 3800 billion Calories of edible product per annum, over 85 percent of which is from the dairy sector. However, the final calorific value of foodstuffs produced is significantly lower than this, as seven eighths of the raw milk yield is processed into other products, resulting in calorific losses of around 30 percent. The final usable calorific output is more like 2900 billion Calories. What actually gets eaten is somewhat less. Various studies in the UK have shown that up to one third of all food products end up as waste.

To produce this quantity of food, Ireland requires 1,100,000 hectares of silage, 240,000 ha of hay, 3,900,000 ha of pasture and 500,000 ha of rough grazing. Additionally, each year Ireland requires 3,600,000 tonnes of dried animal feedstuffs, 500,000 tonnes of beet, turnips and other fodder crops and 450,000 tonnes of imported artificial fertilisers. In 2008, the sector had an operating surplus of €2.3 billion. This was expected to fall to €1.6 billion in 2009.

To produce one tonne of ammonia-based nitrogen fertiliser requires 25-78GJ (0.6-1.9 TOE) of fossil fuels. The corresponding figures for phosphate and potash fertilisers are 3-20 GJ (0.07-0.48 TOE) and 4-13.8 GJ (0.1-0.33 TOE).[1]

The total fossil fuel-derived energy required to produce all of Ireland's agricultural fertilisers is not known but likely to fall between 300 and 600 KTOE - in other words up to twice as much energy as the 300 KTOE used by the entire agriculture sector within Ireland. The fertiliser production figures exclude the additional transportation energy - upwards of 50 KTOE - involved in getting the fertilizers from point of manufacture to the farm in Ireland. Producer countries include the Netherlands, Norway, Morocco, Russia and other FSU states.

The dry feedstuff figure mentioned above includes almost 1,600,000 tonnes of grain grown on Irish soil, with the balance of feedstuffs imported. Production of animal feedstuffs currently accounts for 70 percent of all tillage in Ireland. A further 500-600,000 ha of potential tillage land is used for silage, hay or pasture. Combining the actual and potential tillage land, we find that upwards of 85 percent of the total is used in the production of animal or dairy products.

The inefficiency of this process only becomes fully apparent when the energy value of all the various feed inputs is calculated and compared with the food energy output:

Feedstuff Calories

Feedstuffs: 11,900 billion (very conservative figure)

Silage: 38,700 billion

Hay: 7000 billion

Grazing of pasture: 67,000 billion

Rough grazing: 2100 billion

Other fodder crops: 120 billion

Total: 127,900 billion Calories

Utilisable yield from meat and dairy (human food): 2860 billion Calories

Ratio of input to output: 45:1 (conversion rate of 2.2 percent)

The food energy value of the indigenous grain feedstuffs (grain grown specifically for animal feed) alone is about 5300 billion Calories, almost twice the combined food output of the entire livestock industry.

[1] For more on the embodied energy in artificial fertilisers see: Fuelling a food crisis: The impact of peak oil on food security by Caroline Lucas, Andy Jones and Colin Hines, 2005 and the Levinton Agricultural Report by I.R. Richards, 2000)

cont…

Animal and dairy production exceeds domestic demand by a factor of between three and four. Consequently production is geared primarily at export markets. The system is propped up by generous state and EU agricultural subsidies (currently mainly in the form of non-production-linked payments to farmers, such as the Single Farm Payment). Direct payments to the agriculture sector amount to €2 billion per annum, with the lion's share coming from Europe. A disproportionate amount of agricultural subsidies end up in the bank accounts of the largest corporate and private operators. In 2009, the value of direct payments to the sector is expected to exceed the total operating surplus, meaning that the whole sector is now running at a loss.

Furthermore, there is evidence that the trend in agriculture in Ireland is towards even greater unsustainability, as the sector is driven more and more by large players in the agro-chemical sector, and relies increasingly on imported feedstuffs and fertilisers. This is a new form of colonialism, whereby transnational corporations use the land resource of Ireland as a convenient low-cost production facility serving global markets. The same corporations are greatly assisted by both EU and Irish agriculture policies, as well as by farmer's representative bodies such as the IFA, all of whom show an astonishing lack of appreciation of the food security threat posed by fossil fuel depletion.

One (fully intended) consequence of the globalisation of agriculture is that prices of most agricultural outputs, in real terms, are at their lowest levels ever. Prices paid to producers are controlled by a small number of transnational food retail chains quite prepared to buy in supplies from the other side of the world, irrespective of the consequences for local markets, if they can turn an extra few cents of profit.

Many farmers, although questioning the sanity of contemporary agricultural policies, are obliged to continue participating in this production conveyor belt in order to maintain repayments on loans taken out on machinery or on infrastructure such as slatted sheds or milking parlours. Even if they would wish to return to a more sustainable form of farming, their financial circumstances often dictate otherwise.

Food produced in Ireland for domestic markets

Milk incl. skimmed: 593,000 tonnes ≈ 575,000,000 litres@ 570 Calories/litre = 328 billion
Milk powder: 16,000 tonnes@ 4000 Calories/kg = 64 billion
Cream: 21,000 tonnes@ 3700 Calories/kg = 78 billion
Butter: 16,000 tonnes@ 7370 Calories/kg = 118 billion
Cheese: 22,000 tonnes@ 4290 Calories/kg = 94 billion

Total dairy: 682 billion Calories

Beef: 68,000 tonnes. Food component: 18,100 tonnes@ 1550 Calories/kg=28 billion
Lamb: 30,000 tonnes. Food component: 8,000 tonnes@ 2000 Calories/kg = 16 billion
Pork: 150,000 tonnes. Food component: 39,600 tonnes@ 2250 Calories/kg = 89 billion

Total meat (excl. poultry): 133 billion Calories

Poultry meat: 33,000 tonnes@ 1100 calories = 36 billion
Eggs: 426 million @ 65 calories = 28 billion

Total poultry: 64 billion Calories
(Total meat, poultry and dairy: 879 billion Calories)

Grain: 364 tonnes @ 3300 Calories/kg = 1200 billion
Potatoes: 455,000 tonnes (2000) @ 770 Calories/kg = 350 billion
Other crops: 100 billion (maximum)

Total crops: 1650 billion Calories

Total crops and animal outputs for domestic consumption: 2530 billion

Portion eaten (65-75 percent): c 1600-1900 billion Calories

Estimated food consumed in Ireland:

3200 calories per day x 4300000 people x 365 days ≈ 5000 billion Calories per annum.
Hence only 32-38 percent of the food eaten in Ireland is produced in Ireland.

The Cuba Scenario

Among the most plausible early crisis scenarios is one of increasing production costs (a consequence of rising fossil fuel prices) leading to market instability and a short lived but massive oversupply of meat and dairy products. Further difficulties caused by disruptions in global feedstuff and fertiliser supply chains are likely to result in the dairy and meat sectors shrinking to between one fifth and one third of their current size. Grain and other crops yields can be expected to fall by approximately two thirds as the use of artificial fertilizer declines.

The revised (transitional) output figures may look something like this:

Dairy: 600 billion

Meat and eggs: 150 billion

Grain: 2500 billion (barley and oats 1200 billion)

Other crops: 150 billion

Total output: c3400 billion Calories

Of this, a significant proportion (at least one half of the tillage output) would still be needed for animal feed. The current dominance of the livestock sector is likely to prove a massive stumbling block to implementing the transition to a more sustainable reconfiguration of agriculture. The mistaken perceived need to maintain animal numbers will unnecessarily prolong the unsustainable practice of using good tillage land for the production of animal feed, to the serious detriment of the national food supply.

In this revised transitional scenario, the combined output for human consumption is unlikely to exceed 2200 billion Calories, less than half what Ireland needs to feed itself. This would inevitably lead to further decimation of the livestock sector, as more tillage land is given over to grain for human consumption. The culling of surplus livestock would provide a stop gap for a few years, but without radical reform of the entire agriculture sector, annual food output will struggle to reach 3000 billion Calories, resulting in a 35-40 percent shortfall in national food requirements, even before wastage is factored in. There is also the possibility of a more serious collapse in domestic food production. This essentially is the Cuba scenario.

Cuba's Economic Crisis

[At the end of the 1980s] *"Cuba's economy was faced with the largest crisis of its history. Cuba's favourable rates of trade with the Council of Mutual Economic Assistance (CMEA), the international socialist marketplace, were abruptly terminated in 1989. In 1991, a year marked by the fall of the Berlin Wall, a rapid transition period began that culminated in the total disintegration of the Soviet Union and CMEA in 1991.*

This dissolution meant the loss of almost all of Cuba's import sources and markets, devastating its import-based economy. Cuba depended on CMEA for 85 percent of its trade; a far-reaching economic crisis was imminent. There ensued the "Special Period in Peacetime," commonly referred to as the Special Period, in which measures normally limited to wartime would be taken. The government instituted drastic measures such as planned blackouts, the use of bicycles for mass transportation, and the use of animals in the place of tractors to mitigate the effects of the crisis and help the island survive the oncoming shortages. Along with all other imports, Cuba lost access to its main sources of imported foodstuffs.

Food imports had supplied over half of the calories eaten in Cuba. Extensive food rationing was instituted to ensure equitable distribution in the difficult years to come. Where 19 items were rationed in the 1980s, by the early 1990s virtually all food items became scarce enough to warrant controlled distribution. Some imported goods that had been readily available before the crisis became unavailable. Overall caloric intake fell, and intake of fats and lipids fell even more dramatically. The decrease in caloric and nutrient intake was accompanied by a rise in energy consuming activities such as walking and bicycle riding. Along with other factors, this sudden drop in vitamins and minerals caused several health problems, the worst of which was an eye disorder causing temporary blindness.

Accompanying the loss of food imports was the loss of agricultural inputs such as pesticides, fertilizers, and spare parts. Annual petroleum imports fell from 13 million tons to under seven million tons in only three years, vastly inadequate to run industry and meet the high requirements of tractors, ploughs, and other agricultural equipment. There was not enough fuel to run irrigation pumps and harvest combines.

Domestic food production plummeted. Other services crucial to food supply, such as storage, refrigeration, and distribution networks, also dependent on petroleum, nearly ground to a halt. Without enough fuel to ship food into the cities where it was most needed, some of the remaining harvest spoiled before it could reach consumers. The food crisis was felt across the island, and cities were the most affected, especially the capital city of Havana.

At this moment of crisis, the United States passed the Torricelli Bill (1992), tightening the already existing economic blockade against Cuba, and further damaging the Cuban economy. The Torricelli Bill banned all foreign subsidiaries of U.S. companies from trading with Cuba. Seventy percent of this trade had been in food and medicines. This bill also banned all sea vessels that had been to Cuba from docking in the US within six months, punishable by confiscation. The U.S. placed several conditions on Russia and the newly independent states as they scrambled for U.S. aid, one of which was to end all trade with Cuba"

Extract from *Cultivating Havana: Urban Agriculture and Food Security in the Years of Crisis* by Catherine Murphy, Food First

Preliminary Conclusions

Irish agriculture, as currently configured, is incapable of feeding post-oil Ireland. At best, it might produce two thirds of minimum national dietary requirements. At the same time, the transition to a sustainable system of agriculture capable of meeting national dietary requirements can be expected to take anything up to 12 years.

In Cuba, when the country faced famine as a consequence of food, crude oil, agro-chemicals and machinery being no longer supplied from the Soviet Union, it took about eight years to ramp up indigenous food production to a level capable of meeting the basic dietary requirements of the population. Even so, many people suffered extreme hardship.

Although Cuba had little or no prior warning of the demise of the Soviet Union, it did have a few things in its favour. The tropical climate made it possible to produce two or even three crops a year. Also, there was an extremely efficient, if basic, health care system already in place, with a high number of trained doctors per head of population. An additional factor was the US trade embargo on the Cuba, which heightened the sense of international isolation among the population but which probably also engendered greater solidarity in the face of adversity. There was little expectation of help from outside, which undoubtedly helped focus minds on dealing with the problem.

The uncertainty surrounding the exact nature of the expected food crisis in Ireland make further comparisons with Cuba somewhat problematic. In Ireland's case however, the recent reluctance of the government to admit any culpability for its role inflating a catastrophic speculative bubble, the mismanagement of the State's finances and the subsequent appallingly bad decision to bail out insolvent corporate banking institutions and bankrupt speculative developers does not bode well for the treatment of future crises. Furthermore, the silence at government level on the difficulties posed to Ireland by fossil fuel depletion, and the current complacency surrounding *energy* security issues, suggests it is entirely reasonable to expect the State will also downplay Ireland's vulnerability to *food* shortage, resulting in the population considerably underestimating the risks involved. This in turn will lead to unnecessary lack of preparedness and possibly false expectations that help will arrive from elsewhere.

It is time to start ringing the alarm bells. We may not have 12 years.

Further information and feedback

This document should be treated as a work in progress and will be updated on a regular basis. A few errors concerning fertiliser imports in the earlier draft have now been corrected.

This document will eventually form part of a much broader treatise on food security. This larger project is now well underway. Articles wll be posted on my own personal website: www.andywilson.ie Comments and contributions are especially welcome.

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