

**Farming in the future** is going to have to brave rather unpredictable weather, as well as reduce carbon emissions and store carbon in the soil. We may also have to cope with an increase in climate refugees, and people wanting to live closer to the land.

There are techniques awaiting use, agroforestry, food forests, silvipasture etc, that involve diverse mixed crops, lots of perennials and trees, leaving the soil largely undisturbed, reaping a variety of crops including non-food, that also have potential for use by adding value.

Given the land we've got and the population, can we feed ourselves?

CWAC total area 353.9 sq mi (916.7 km<sup>2</sup>); if it's typical of England, 70% is farmland. 36% of the agricultural land is croppable (arable), or 25% of the total land area. Most of the rest is grassland, rough grazing, or woodland. ([https://en.wikipedia.org/wiki/Agriculture\\_in\\_the\\_United\\_Kingdom](https://en.wikipedia.org/wiki/Agriculture_in_the_United_Kingdom))

Actual figures are 37.42% non-irrigated arable, 43.02% pasture, 0.47% other agric, 2.33% forest, 1.8% saltmarsh, 0.43% water bodies. So 80.91% agricultural (leaving the woodland, saltmarsh and water alone) (from [https://figshare.com/articles/dataset/A\\_Land\\_Cover\\_Atlas\\_of\\_the\\_United\\_Kingdom\\_Maps\\_/5219956?file=8996887](https://figshare.com/articles/dataset/A_Land_Cover_Atlas_of_the_United_Kingdom_Maps_/5219956?file=8996887))

Using Simon Fairlie's figures, if we aim for Livestock Permaculture, which calls for 1.8 ha to feed 8 people: Using 70% of land under agriculture, 353.9 sq miles x 0.7 x 640 = 158,547 acres. Or 64162 hectares, enough to feed 285164 people.

Using 80.91%, 353.9 x 0.8091 x 640 = 183258 acres, 74162 ha, enough to feed 329608 people.

Actual population 343823 in mid 2020. (<https://www.cheshirewestandchester.gov.uk/your-council/key-statistics-and-data/state-of-the-borough/population.aspx>). Livestock Permaculture is probably the most sustainable of his scenarios, but feeds nearly the fewest.

### **The advantages of using permaculture**

Permaculture examines and takes feedback from its surroundings, so works with the local population, the land, the ecology, terrain and climate; local needs and local surpluses. It's a multipurpose technique.

Permaculturists look for inspiration from Nature, imitating Nature's ways. They therefore favour polycultures, minimum till and landrace varieties.

Polycultures involve growing more than one crop in a field, sometimes in distinct rows, sometimes two species mixed but with separable crops, often with trees to provide stability, deep roots and shelter; but can be full on agroforestry of many mixed species, at all levels from tree canopy to underground, including climbers.

Animals can also be involved, as in chickens in agroforestry or larger herbivores among established trees – silvipasture. Animals enjoy the shelter and change of diet amongst trees.

Tilling encourages the oxidation of humus in the soil, leading to lower soil carbon and a soil that requires more fertiliser and water. It also disrupts the soil creatures, including fungi, which have been found to work with most plants, assisting them to take up nutrients and affecting their flavour, and no doubt, nutrient value. Mycorrhizal fungi are fed sugars by the plants in return for supplying the plant with minerals. Using fertiliser stops the plant feeding the fungi, so reduces soil carbon and ensures dependence on the fertiliser, a well-known expense.

Landrace varieties are mixtures of cultivars that with repeated seed saving and resowing becomes a happy mix that performs reliably, different strains within the mix performing more or less well each season. It's especially useful for grain and pulse crops, but can also be used for others. With adaptations for outbreeding varieties: cabbage and cauliflower can cross, the hybrid is less marketable, so selected individuals would have to be isolated to set seed.

These techniques are likely to involve more labour, working with complex ecological systems requires observation and intelligence, while also being lighter on the soil and not needing gasoline. Farms nearer centres of population may have more available labour than more distant farms. It's more interesting, varied work, potentially 12 months a year, and can involve 'added value' activities, maybe working on non-food products, under shelter when the weather's inclement. However, the food is local, fresh, healthy and need not be wrapped in plastic. Issues of farmer loneliness and Covid transmission are also reduced.

These techniques are also wildlife friendly, so wildflower borders, ponds, diverse hedges, trees etc., are built in to the system.

I know of two permaculture farms in Mid-Cheshire, and various other properties and plots embracing permaculture and organic methods. Around the country, there are various models that may be taken up, such as food forests, community gardens, farm allotments, community supported agriculture, volunteer workers (who give their time for experience and/or accommodation). The Transition Town movement is founded on permaculture principles. Its principles have been learnt from long-established Indigenous Peoples, who have long known to see, hear, smell, feel and taste the environment in order to survive without undermining the prospects of future generations.

Simon Fairlie's Can Britain Feed Itself has been posted on the TN website:

<https://transitionnorthwich.weebly.com/uploads/7/6/6/4/76640477/canbritain.pdf>

MELLANBY'S BASIC DIET 1975

One hectare of arable plus one of pasture feeds 10 people (64162 ha feeds 320810)

CHEMICAL WITH LIVESTOCK 2005

One hectare of arable plus 1.5 hectare of pasture feeds 14 people (64162 ha feeds 359307)

CHEMICAL VEGAN 2005

One hectare of arable feeds 20 people (64162 ha feeds 1283240)

ORGANIC VEGAN 2005

One hectare of arable feeds 8 people (64162 ha feeds 513296)

ORGANIC WITH LIVESTOCK (2005)

One hectare of arable plus one of pasture feeds 7.5 people (64162 ha feeds 240607)

LIVESTOCK PERMACuLTuRE 2005

One hectare of arable plus 0.8 ha of pasture supplies 8 people (64162 ha feeds 285164)

VEGAN PERMACuLTuRE

One hectare of arable supplies 8.5 people (64162 ha feeds 545377)