



## More Thoughts on Relocalization

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Over the past week, [Stuart Staniford](#) and [Sharon Astyk](#) have written thought-provoking essays on the nexus of Peak Oil and relocalization, with Staniford suggesting that peak oil will not result in relocalization of agriculture because the industrialization of agriculture is not practicably reversible, and Astyk rebutting that idea. I think that both essays make important points, but I would like to offer a third perspective: that we have insufficient information to reach a conclusion about *when* energy scarcity will result in relocalization of agriculture, but that we will likely cross this threshold in the not-too-distant future and should prepare accordingly.

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Astyk's main critique of Staniford's essay is, while important, focused primarily on the somewhat dismissive and partisan language of "reversalism." I agree with this critique, and will not rehash it here. This critique does not, however, address the core of Staniford's argument that centralization and hierarchal organization in agriculture will stabilize or intensify in the face of rising energy prices.

In my view, the primary weakness of Staniford's analysis is the hidden substitution of causation for correlation in the body of his argument. My own writings have often been criticized as lacking in scientific analysis of hard data, and I accept that as the price of trying to approach causation directly. Graphs of data points, such as those dominating Staniford's analysis, can clearly convey correlation with some causal mechanism—say an increasing linear function—but do nothing to establish that causal relationship itself. These graphs do nothing to establish a causal relationship between, to use Staniford's examples, labor per acre or profit margin per acre and oil price. It could be pure coincidence that they appear positively correlated, much like the Virgin Mary on a piece of toast. As importantly, such correlations provide no insight as to whether the current correlative relationship will continue as oil prices increase—a small segment of a linear function, an exponential function, or a parabolic function may all fit this correlation, yet diverge wildly at later points. Here's an example: a graph showing the driving fatalities by age for 13 to 17 year olds will show a remarkable positive correlation between higher deaths at higher ages. The implied causality in such a graph is that aging causes driving fatalities. Of course, with the benefit of a much broader perspective, additional data showing that driving fatalities begin to decline significantly after roughly the age of 25, and the knowledge that (in the U.S.) one can get a license to drive at age 16, an alternate likely causality arises. This is, essentially, my critique of Standiford's argument--that while correlation may suggest causation on the very limited data set available to us, we really don't gain any insight into what will happen--or what form of agriculture will be most efficient--at oil prices equivalent to \$200, \$300, or more dollars per barrel. At risk of pushing too far into the philosophical, Staniford's analysis places us in the equivalent of Plato's cave where all we can see is the 13-17 year segment of the driving fatality graph. I won't belabor

this point any further—Scottish philosopher David Hume [said this far better than I could](#) if anyone cares to delve deeper into this line of thought.

Suffice it to say that, if we reject this substitution of causation for correlation, we're left with Staniford's rather bald conclusion that "industrial farmers are extremely efficient, and there is no way to compete with them except by becoming one" based solely on the presumptive correlation between various agricultural data in very recent history with historical oil prices. I don't find that convincing, but Staniford must be given his due—he presents a plausible case, and certainly one that doesn't disprove itself.

I think that the best way to approach this problem is to try to locate actual causal relationships that either A) make centralization and hierarchy more efficient means of organizing agriculture in the face of rising energy prices, or B) make decentralization a more efficient means of organizing agriculture in the face of rising energy prices:

### **A. Why would centralization of agriculture increase efficiency?**

1. Economy of place: It is more efficient to grow oranges in Florida than in a heated greenhouse in upstate New York (or, to use the classic example, wine in Portugal than in England).
2. Economy of scale: It is more efficient for one man to grow ten orange trees than ten men to each grow one for a variety of reasons.
3. Specialization of knowledge processes: A contributor to #2 above, but particularly important in the era of increasingly scientific and knowledge intensive farming—farmers can afford to specialize in farming, whereas people who are only part-time farmers cannot to the same degree.
4. Justification for intensive capital expenditure: An industrial farmer can justify the expense of a complex combine harvester that automates processes, whereas a small holder may not be able to.

### **B. Why would decentralization of agriculture increase efficiency?**

1. Transportation & operation cost: decentralized farming has the potential to require transportation over shorter distances to market than centralized farming, and therefore less embodied energy cost. Likewise, tractors and combines use oil, whereas hoeing and hand weeding do not.
2. Superior suitability for sustainable operation: for now, decentralized agriculture seems more capable of maintaining topsoil and is more adaptable to varying water regimes.
3. Greater resiliency to black swan & gray swan events: decentralized agriculture is less susceptible to terrorism, is more likely to incorporate the biodiversity necessary to overcome disease, and may be more adaptable in the face of global warming.
4. Less exposure to capital cost creep: decentralized agriculture is less dependent on expensive machinery that is subject to increasing cost as the cost of manufacture and raw materials increase.

There are undoubtedly many more reasons on both sides—the intent here is to set up the following balancing problem, not to present an exhaustive list.

It becomes apparent that resolving the centralization vs. decentralization of agriculture dispute requires balancing these factors—more specifically, balancing these factors at a given cost of energy. I don't think that it can be reasonably disputed that, at some cost of energy, it is more efficient to centralize agriculture.\* As a hypothetical, if energy is free, there is no substantive barrier to total centralization of all agriculture. Likewise, I don't think it can be reasonably disputed that, at some cost of energy, it is more efficient to decentralize agricultural production. As a hypothetical, if energy is so expensive as to be totally use-prohibitive to all parties (e.g.

nothing but human labor is available), then centralization that requires food transportation of a greater distance than a human can walk before the food spoils, or that requires more calories for a human to transport to market than the cargo contains, is infeasible. Obviously, we are faced with the challenge of balancing centralization vs. decentralization for some real cost of energy between free and use-prohibitive.

This analysis also confronts some significant knowledge gaps. Centralized agriculture is currently engaged in practices that are widely considered non-sustainable. Industrial farming practices are rapidly depleting topsoil and rely on non-renewable chemical inputs. Conversely, methods of decentralized agriculture exist that are widely considered fully sustainable—permaculture, Fukuoka method, and John Jeavon's biointensive method, just to name a few. It may well be possible to adopt industrial-scale methods that are equally sustainable, but the efficiency loss in doing so is unknown. It seems unfair to compare an unsustainable method with a sustainable one, but no data currently exists sufficient to bridge this gap. Another factor to be addressed is the opportunity cost of time spent in decentralized agriculture/horticulture. If there are abundant opportunities to earn high wages relative to food costs—something true in today's Western economies, but uncertain at best in a future scenario of \$300/barrel oil—then the opportunity cost of spending personal time laboring in a garden weighs heavily against decentralized agriculture. However, if there is massive unemployment and it isn't possible for most to earn enough to buy necessary food due to the embodied cost of energy inputs, then it is more rational to spend time gardening no matter how efficient centralized agriculture is.

Furthermore, it is necessary to consider the sunk cost and subsidies supporting centralized agriculture. Just two examples:

- The trillion dollar infrastructure of highways necessary to support our centralized system has already been paid for (well, is still being paid for in many respects) whereas decentralized agriculture has no trillion dollar head start. This infrastructure is supported by ongoing maintenance paid for via distributed taxes, not by tax attached to the price of food or collected from individual farmers. At some cost of energy, maintaining such a system is no longer practicable, erasing this current advantage for centralized agriculture.

- The existing urbanization of America (just to cite one example) makes gardening impracticable for many, and is a relic of cheap food and the inexpensive transportation network capable of supporting urbanization. There is a great reluctance to relocate for the purpose of making gardening affordable now, but at some theoretical cost of food there is a tipping point where people would stream to small holdings, dramatically erasing this current advantage for centralized agriculture.

Hopefully I have highlighted the methodological difficulties in determining whether centralized or decentralized agriculture is more efficient at a given price of oil we have not yet reached—and therefore whether this historical process is likely to be “reversible” at some price. I'd love to tell you that, at \$254/barrel, society will tip from centralized to decentralized agriculture. Clearly I can't do that, and I submit that there is insufficient data for anyone to do so at this time (or, to demonstrate that the same won't happen). What I will suggest is that it seems clear to me that, at some price of oil, decentralized agriculture will be more efficient. Price may actually be misleading on this point—if one accepts a general energy descent future (which I realize is a big \*IF\* for many), then demand destruction may prevent prices of energy from continuing forever upward. In such a scenario it will actually be “at some availability of surplus energy” where decentralization becomes more efficient. If one extrapolates any of the various gloomier future scenarios for world energy production often presented it seems very possible that this threshold

may be crossed within a generation or two. And, when we reach this threshold, those who have prepared or transitioned early will be better situated. There are, without doubt, vast uncertainties here, but the precautionary principle suggests that we prepare for the possibility that this point comes sooner rather than later. Finally, I would suggest that there are benefits of decentralized agriculture that reach beyond mere calculations of price, profit, and meeting minimal nutrition requirements (see notes below). There are, after all, reasons why people go on vacation to Tuscany instead of Kansas.\*\*

\* What are our goals—is it merely to meet our minimal nutritional requirements, or to amass the most material possessions? Who benefits from centralized processes vs. decentralized, and what political structures do they tend to support and accrete? Are we seeking to maximize the mean or median fulfillment of human ontogeny? These are ultimately moral and philosophical questions, and ones that I will not attempt to answer here. I do, however, wish to draw the reader's attention to the complexities raised by trying to address this dilemma while simultaneously balancing the benefits of centralization and decentralization. For more on centralization vs. decentralization, consider my essay "[A Theory of Power](#)."

\*\* For a discussion of Tuscan hill towns as a mode of decentralized coordination, consider my essay "[The Hamlet Economy](#)."



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