

2012

## Cows v. Capitalists: Visions of a Post-Carbon Economy

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### Recommended Citation

Peck, A. (2021). Cows v. Capitalists: Visions of a Post-Carbon Economy. *Journal of Food Law & Policy*, 8(1). Retrieved from <https://scholarworks.uark.edu/jflp/vol8/iss1/7>

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COWS V. CAPITALISTS: VISIONS OF A POST-CARBON ECONOMY

BOOK REVIEW, SIMON FAIRLIE, *MEAT: A BENIGN EXTRAVAGANCE*  
(CHELSEA GREEN PUBLISHING 2010)

*Alison Peck\**

I. INTRODUCTION

I was tempted to entitle this book review something like, “Why the Farm Bill Is the Key to Our Energy Future (Hint: It’s Not About Ethanol, Methane Emissions, or Carbon Sinks).” But in addition to being too long to fit across the header of a law review page, such a title would have been slightly misleading. Actually, in Simon Fairlie’s view, our future *is* about ethanol, methane emissions, and carbon sinks – but not in the way our current agricultural policies understand and deal with these subjects.

Note the sleight-of-hand here: Simon Fairlie’s book, *Meat: A Benign Extravagance*,<sup>1</sup> is about . . . energy policy? At its most potent level, Fairlie’s book is far more ambitious than its title implies, concerned not just with cows but with the by-products of capitalism, not just with enteric fermentation but with energy capture and distribution across an entire society. Fairlie states that his purpose in writing the book was to examine “the environmental ethics of eating meat.”<sup>2</sup> A farmer and editor of the U.K. land rights magazine, *The Land*,<sup>3</sup> Fairlie discloses not only his personal prejudice in favor of keeping (and eating) livestock, but also his misgivings about the environmental impacts of meat often cited by vegetarians and vegans.<sup>4</sup> Meat-eating, they say, takes grain out of the mouths of the poor and feeds it to animals to feed the wealthy; it contributes disproportionately to global warming; it diverts too much land from wild space and wildlife habitat.<sup>5</sup> Fairlie undertook, he says, to write a

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1. SIMON FAIRLIE, *MEAT: A BENIGN EXTRAVAGANCE* 2 (Chelsea Green Pub., U.S. ed. 2010).

2. *Id.* at 2.

3. *Id.* at 323. *The Land*, not to be confused with the U.S. publication of the same name, is available online at THE LAND, <http://www.thelandmagazine.org.uk/> (last visited May 10, 2012).

4. *Id.* at 3.

5. *Id.* at 2.

comprehensive analysis of all of these environmental accusations against meat-eating,<sup>6</sup> and in that effort he has succeeded famously – more so than the most well-funded and well-staffed IGOs, NGOs, and academics now wading into similar murky waters.<sup>7</sup>

But in undertaking to defend meat-eating (and he does defend it, albeit only under specific ecological conditions), Fairlie does more than make a case for the occasional steak from a grass-fed cow at the end of its useful life as a walking manure-spreader on a diversified farm.<sup>8</sup> In the alternate universe methodically constructed and meticulously defended by Fairlie, some amount of animal agriculture is not only environmentally benign but the lynchpin of an alternative society and economy based on non-fossil-fuel energy – including the kind provided on the hoof. In Fairlie's view, the modern energy crisis, and the reason agricultural reform may be the remedy for it, derives from the fact that "economies of scale [in production] are more than offset by diseconomies of distribution."<sup>9</sup> Fairlie argues that fiddling around with the sources of the energy we generate and transmit, from oil and coal power to natural gas or even solar panels and fuel cells, does not address the structural problem created when the Industrial Revolution separated the majority of the *people* from the majority of the *resources*. Even a renewable energy-based grid, in Fairlie's view,

magically transfers energy around the country without any transmission losses; but the material things of life cannot

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6. FAIRLIE, *supra* note 1, at 2.

7. See, e.g., KARL-HEINZ ERB ET AL., COMPASSION IN WORLD FARMING, EATING THE PLANET: FEEDING AND FUELLING THE WORLD SUSTAINABLY, FAIRLY AND HUMANELY – A SCOPING STUDY (2009); Maurice E. Pitesky et al., *Clearing the Air: Livestock's Contribution to Climate Change*, in 103 ADVANCES IN AGRONOMY 1 (2009); SUSTAINABLE DEVELOPMENT COMMISSION (U.K.), SETTING THE TABLE: ADVICE TO GOVERNMENT ON PRIORITY ELEMENTS OF SUSTAINABLE DIETS (2009); TOM MACMILLAN & RACHAEL DURRANT, WWF AND FOOD ETHICS COUNCIL, LIVESTOCK CONSUMPTION AND CLIMATE CHANGE: A FRAMEWORK FOR DIALOGUE (2009); UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION, LIVESTOCK IN THE BALANCE (2009); HENNING STEINFELD ET AL., UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION, LIVESTOCK'S LONG SHADOW: ENVIRONMENTAL ISSUES AND OPTIONS (2006).

8. For an overview of Fairlie's theory of the role of livestock in an ecologically-sound society, see especially FAIRLIE, *supra* note 1, at Ch. 4.

9. *Id.* at 286. For this notion, Fairlie cites American agrarian theorist Ralph Borsodi, who popularized the "back to the land" notion of rural self-sufficiency during the 1920s and 1930s. See RALPH BORSODI, THE DISTRIBUTION AGE (1927); *The Plowboy Interview – Dr. Ralph Borsodi*, SOIL AND HEALTH, <http://www.soilandhealth.org/03sov/0303critic/brsdi.intrvw/the%20plowboy-borsodi%20interview.htm> (last visited May 10, 2012) (providing biographical data on Borsodi).

be moved without transmission losses. You cannot transport food, fibre and building materials around the country without generating expenses which over the last century have been paid for by cheap fossil fuels. If you derive all your water from a small number of sources which offer economies of scale, you not only experience diseconomies of distribution (infrastructure costs, pumping costs and leaks), you also run the risk of running your sources dry. And if you bring all this biomass into the cities to maintain an urban population, then you invite various kinds of congestion (too many vehicles, too much smoke, too much waste, too many animal diseases); and you have to find a way of getting the biomass back out again, once it has been used, so that it can go back to the land.<sup>10</sup>

Of course, Fairlie is by no means the first to articulate a vision of a post-carbon economy in which human and animal labor are once again valued, and in which waste of natural and human resources is strategically minimized. This vision is a central animating force behind the “permaculture” movement (better known in the United States by the arguably more limited term, “sustainable agriculture”) to which Fairlie avowedly belongs.<sup>11</sup> The unusual success behind Fairlie’s argument lies in his painstaking walk through mountains of data behind the foundational questions on which this vision depends: Does meat production reduce the total number of calories in the global food supply, and if so, by how much?<sup>12</sup> Would a vegan agricultural society produce more total food than a permaculture livestock society?<sup>13</sup> Does the livestock sector really generate more greenhouse gas emissions than the transportation sector?<sup>14</sup> With Fairlie as guide, that walk is always informative;<sup>15</sup> at times dazzling in its

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10. FAIRLIE, *supra* note 1, at 285.

11. *See id.* at 3.

12. *See id.* at Ch. 3.

13. *See id.* at Ch. 9. Fairlie limits his analysis to Great Britain, a fertile but densely populated region. *See id.* Applicability of this analysis to the United States and the world will be considered below.

14. *See id.* at Ch. 13.

15. In the first substantive chapter of the book, for instance, Fairlie considers the impact of animal digestive systems on the patterns of human civilization. Grazing cows were more suited to the nomadic tribes that swept across Europe, while waste-consuming pigs were more suitable for cultures, like those of China, South East Asia, and Polynesia, who tended to stay put. *See FAIRLIE, supra* note 1, at 4-7. Although cows have thus been dominant in Western civilizations, Fairlie notes that pigs once ran

analytical rigor;<sup>16</sup> and often devastating to the poorly-masked agendas passing as scholarship from both production agriculture and vegan groups.<sup>17</sup> Perhaps an even more pleasant surprise, *Meat* is more entertaining than serious scholarship has any right to be, complete with comical characters,<sup>18</sup> nefarious plots,<sup>19</sup> and more than a little self-mockery.<sup>20</sup>

This review will attempt to highlight one of the more important arguments against meat consumption that Fairlie tackles: that animal agriculture results in less total food being produced globally and is, therefore, a cause of world hunger. Section II considers Fairlie's review of what, he says, we "academics pompously call 'the literature,'"<sup>21</sup> tracking his analysis to the conclusion in favor of a modest amount of livestock production. The section then looks at how Fairlie's "default livestock" proposition translates into a vision of a self-sufficient British agriculture as a model for an entire post-carbon economy – and some of the practical objections and opportunities he envisions toward actually achieving it.

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loose on Manhattan Island, and what we now know as Wall Street started as a stockade. *Id.* at 7.

16. See discussion *infra* Section II.

17. See discussion of Chapter 3, *infra* Section II.

18. Along the way, Fairlie encounters an often-cited "authority" on livestock greenhouse gas emissions who turns out to be an expert in "photon beam therapy level graphic calorimetry" and author of a one-page opinion piece on GHG emissions. *Id.* at 157-58 (which showed "a photo of the author, a genial soul, blowing on a euphonium, who has 'a passion for good food, radical thinking and playing instruments in the bass clef'"); a very important soil scientist. *Id.* at 201 ("She wrote back: 'We are in the middle of an extremely busy fieldwork period here. On top of that, hundreds of e-mails come in from all over the world every day. I suggest you READ the articles on the Amazing Carbon website – you will find all your answers there.' I had read nearly half the website before e-mailing, and so sat down to read the rest."); and anti-speciesist philosopher Peter Singer, whose comment about the "unusual" case of protecting crops against animal pests leads Fairlie to observe that Singer "seems blissfully ignorant about the perils of growing vegetables." *Id.* at 27.

19. See, e.g., FAIRLIE, *supra* note 1, at 34 ("Whilst a casual reader or slipshod journalist might easily overlook this flaw in CAST's logic, and its evasion of the obvious conclusion, it is hard to believe that the authors of a report endorsed by 38 scientific bodies were too stupid to spot them, so I am inclined to conclude that they were happy to mislead.").

20. Fairlie reports that, after a six-year stint as a vegetarian, the problem of male kids from a dairy goat herd turned him into "a born-again carnivore (the worst kind)." *Id.* at 3. After articulating his vision of a permaculture economy, Fairlie concedes, "[t]his may be the point at which some readers, if they have persisted this far, will finally throw this book away in disgust exclaiming that the author is off with the fairies." *Id.* at 283.

21. *Id.* at 2.

Fairlie's book, originally released in the U.K., focuses in detail on the prospects of a permaculture society in the U.K. To explore these ideas in a U.S. context, Section III considers a few implications of Fairlie's arguments for current U.S. agriculture policy. First, does Fairlie's calculation of a self-sufficient U.K. agriculture have any relevance for the U.S., one of the world's leading agricultural exporters? If Fairlie's vision is taken seriously, can farm policy move U.S. agriculture closer to that vision? What policy tools could help it along in the 2012 Farm Bill?

## II. PIGS AND SPACE: WASTE, NUTRIENT CYCLING, AND THE ELIMINATION OF DISTRIBUTIONAL INEFFICIENCIES

The first two sections of *Meat* primarily deal with the question of whether animal agriculture contributes to world hunger. Over six chapters, Fairlie looks closely at the common claim that livestock production demands more land than vegan agriculture, and thus reduces the total human food supply.<sup>22</sup> In three subsequent chapters, Fairlie considers the complexities of the relationship between agricultural production practices and food security.<sup>23</sup> Ultimately, Fairlie concludes that the practice of feeding large amounts of grain to cattle, as is the case in intensive livestock production operations, does reduce the total available human food supply. The "permaculture" model of livestock production, however, actually *increases* the total amount of human food available, by Fairlie's calculations. This conclusion (a convenient one for a researcher coming from Fairlie's background and viewpoint) would be less persuasive without the careful journey Fairlie takes through the data to arrive there. It will be worthwhile to follow Fairlie in the trenches of that journey for a spell before considering the larger implications of his argument.

### *A. Does Modern Animal Agriculture Lead to Less Total Food for Humans?*

Fairlie begins his study by noting a statistic commonly thrown around when discussing the amount of potential human food fed to animals: 10:1.<sup>24</sup> This "feed conversion ratio" refers to the number of units of nutrition that must be fed to an animal to produce a unit of nutrition of meat, dairy or eggs. Although feed conversion ratios cited vary widely, Fairlie documents that the 10:1 figure is common.<sup>25</sup> Doing a back-of-the-envelope check

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22. See generally FAIRLIE, *supra* note 1, at 12-90 (Chs. 3-8).

23. See *id.* at 92-138 (Chs. 9-11).

24. See *id.* at 16-17.

25. See *id.* at 16-17.

based on figures from a non-ideological agronomic guide, Fairlie concludes that the number is about right – at least for U.K. grain-fed beef.<sup>26</sup>

The obvious question raised by this analysis is not what the feed conversion ratio would be just for grain-fed beef, but for *all* animal products, most of which can be produced more efficiently than beef.<sup>27</sup> To find the answer, Fairlie stages a face-off between studies by two groups with axes to grind in the debate. One study, by the vegan NGO Compassion in World Farming (CIWF), reports feed conversion ratios of 10:1 for beef, 4-5.5:1 for pork, 2.1-3:1 for poultry, and 1.5-2:1 for farmed fish.<sup>28</sup> CIWF's analysis stops there. The second, from the U.S. industry-based Council for Agricultural Science and Technology (CAST), reports a conversion ratio of 14.3:1 for beef, 7.2:1 for all meat products averaged; 5.9:1 for eggs, and 4:1 for milk.<sup>29</sup> CAST starts from these somewhat higher figures, but through a variety of adjustments (discussed below), concludes that the true relative efficiency for all animal products is more like 1.4:1, and is arguably offset by the higher nutritional efficiency of animal products.<sup>30</sup>

But the value of *Meat* is that Fairlie is never content with the simple answer. Fairlie proceeds to point out the ways that both sides use the data to support their ideological positions, and in doing so “misrepresent the real state of affairs.”<sup>31</sup> The problem with the CIWF (vegan) study is that it ignores the fact that animals provide services other than food, and those services have value for humans. CIWF simply concludes from the feed conversion ratios that animal agriculture is highly inefficient without taking account of a variety of factors that substantially offset those apparent inefficiencies. Fairlie's experience as a livestock farmer informs his subsequent analysis to great benefit, resulting in a detailed accounting of all the value of animal production not captured by feed conversion ratios. This value includes the nutrient density and variety of meat compared with a vegan diet;<sup>32</sup> by-products from animals such as hides, collagen and gelatin,

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26. *Id.* at 18.

27. *See id.* at 19.

28. FAIRLIE, *supra* note 1, at 19 (citing MARK GOLD, THE GLOBAL BENEFITS OF EATING LESS MEAT (2004), available at [http://www.ciwf.org.uk/includes/documents/cm\\_docs/2008/g/global\\_benefits\\_of\\_eating\\_less\\_meat.pdf](http://www.ciwf.org.uk/includes/documents/cm_docs/2008/g/global_benefits_of_eating_less_meat.pdf) (last visited May 10, 2012)).

29. *Id.* at 20 (citing COUNCIL FOR AGRICULTURAL SCIENCE AND TECHNOLOGY, ANIMAL AGRICULTURE AND FOOD SUPPLY, available at [http://www.cast-science.org/publications/index.cfm/animal\\_agriculture\\_and\\_global\\_food\\_supply?show=product&productID=2836](http://www.cast-science.org/publications/index.cfm/animal_agriculture_and_global_food_supply?show=product&productID=2836) (last visited May 10, 2012) [hereinafter *CAST*]).

30. *See id.*

31. *Id.*

32. *See id.* at 21.

and tallow;<sup>33</sup> higher yields for feed crops (such as alfalfa) than human food crops on some lands;<sup>34</sup> and, especially in the case of pigs, recycling of waste by consuming food scraps, fibrous biomass, and other residues inedible by humans.<sup>35</sup> The efficiency gap between meat and grain, the author convincingly demonstrates, is “a good deal more slender than [CIWF’s] table suggests.”<sup>36</sup>

But animal agriculture hardly gets a pass either. Fairlie agrees, based on the analysis above, with CAST’s starting point that the efficiency difference between meat and grain may be as low as 1.4:1 across all sources.<sup>37</sup> And CAST’s figure that meat has 1.4 times the nutritional value for humans as grains is also not far from Fairlie’s own assumption.<sup>38</sup> Based on those equivalent numbers, CAST’s report concludes, “[t]hus diverting grains from animal production to direct human consumption would, in the long term, result in little increase in total food protein.”<sup>39</sup>

Fairlie will have none of it. The problem, he notes, is that the 1.4 conversion ratio is an average across *all* livestock, including those fed partly or entirely on grass, biomass, and waste not edible by humans.<sup>40</sup> The conversion rate of *human edible food* to meat from the U.S. feedlot system, Fairlie calculates, is around 3.2:1.<sup>41</sup> If we stopped feeding grain to animals, we would still retain the meat and dairy supply from animals not fed on grains while also obtaining more than three times the nutritional benefit from the grain foregone as animal feed.<sup>42</sup> Fairlie notes that the statement quoted above was taken from the report’s interpretive summary while the body of the report allows that the averaging involved in the 1.4:1 conversion ratio “does mean that feeding less grain to animals would translate to somewhat more total food for humans.”<sup>43</sup> Fairlie is (justifiably) incredulous: “Somewhat more total food for humans?” How much is somewhat? Is not this the main reason for CAST carrying out all its exhaustive ‘input:output’ analyses? What could be more relevant to a report entitled *Animal Agriculture and Global Food Supply*?<sup>44</sup> The answer, however, is easy to glean from CAST’s figures, and, by Fairlie’s

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33. See FAIRLIE, *supra* note 1, at 22-24.

34. See *id.* at 24-25.

35. See *id.* at 26-29.

36. *Id.* at 20.

37. See *id.* at 31-32.

38. See FAIRLIE, *supra* note 1, at 21.

39. *Id.* at 32 (citing CAST, *supra* note 29, at 16).

40. See *id.* at 33.

41. *Id.* at 31.

42. See *id.* at 33.

43. FAIRLIE, *supra* note 1, at 33 (quoting CAST, *supra* note 29).

44. *Id.*



calculations, the amount is 400 million tons of grains – “enough to feed about 1.3 billion people . . . [which is] at least 300 million more than the number estimated to be malnourished.”<sup>45</sup>

From time to time, Fairlie relies on loose guesstimates to determine values, starting from available data and adjusting for factors that seem to be overlooked.<sup>46</sup> These out-of-thin-air numbers can sometimes be unsatisfying, especially after bearing with the author through so much data and analytical detail. The inevitable imprecision of some figures, however, ultimately does not undermine one of *Meat*'s primary contributions to “the literature:” a well-reasoned, finely detailed, and less ideological challenge to both sides of the meat-eater-versus-vegan debate.

### B. “Default Livestock” and the Costs of Intensification

These figures suggest Fairlie's proposed solution to the meat-eating/vegan debate. While much of the grain we currently feed to animals could be used to feed hungry people, we would still be able to produce a certain amount of animal products with very low ecological impact as a “by-product or co-product of an integrated system.”<sup>47</sup> Fairlie details a variety of circumstances in which animals can be used to bring nutrients into the system that are otherwise inaccessible to humans, to recycle waste that would otherwise be lost as an energy source, or consumed as a by-product where animals are kept for reasons other than food production. Examples include feeding food processing waste, crop residues, food

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45. *Id.* Food and Agriculture Organization reports that, for 2006-2008, 850 million people (13 percent of global population) were malnourished. See *Hunger*, FOOD AND AGRICULTURE ORGANIZATION, <http://www.fao.org/hunger/en/> (last visited May 10, 2012). Fairlie does not specify the basis of his figure that 400 million tons of grain would feed 1.3 billion people. The amount of grain (or calories or protein) needed to meet one person's nutritional needs is difficult to ascertain because of substantial human variability and adaptability, see VACLAV SMIL, *FEEDING THE WORLD* 211-48 (2000).

46. With regard to nutrient density, for example, he notes that CAST and other researchers describe animal protein as 1.4 times more biologically valuable for humans than a similar amount of plant protein. FAIRLIE, *supra* note 1, at 21. In Fairlie's view, however, the most important factor in meeting human dietary needs is, in most cases, total energy (calories), not protein. On the other hand, many societies have expressed a value for the dietary variety provided by some animal products. Based on these two adjustments, Fairlie (somehow) arrives at a rough value of 1.2:1 for the relative nutritional value of animal and plant food sources. *Id.* at 21.

47. *Id.* at 36.

waste, and slaughterhouse waste<sup>48</sup> to animals, especially pigs; responsible grazing on non-arable land or land rotated out of production to build fertility; and consumption of by-products from animals kept primarily to provide traction for plowing.<sup>49</sup>

Fairlie relies on a variety of sources to produce a rough estimate for the amount of animal products produced from these categories, and he chooses to place the amount of “default livestock” production at around fifty percent of current global animal production.<sup>50</sup> Based on one-half of global animal production figures for 2000, this amounts to about three quarter-pound hamburgers and about one and a third pints of milk per person on Earth, per week.<sup>51</sup> Expand the population from six to nine billion (predicted by 2050) and the amount is cut by about a third.<sup>52</sup> While the author acknowledges that this is “slim pickings for those of us who like our meat and cheese,” he points out that this amount is ecologically “free.”<sup>53</sup> Given the surplus of grain detailed in a previous chapter, he estimates that we could equitably and ecologically produce about half again as much as the “default” amount through surplus grain feed.<sup>54</sup>

This brings the author squarely into confrontation with the view expressed by FAO in their 2006 report, *Livestock’s Long Shadow*, which assumes that the animal agricultural industry must intensify in order to meet rising global demand.<sup>55</sup> This choice is normative, not ecological or statistical, and here Fairlie is as straightforward and reasoned as he is controversial. Why assume, Fairlie asks, that “[t]he poorest in the developing world have no choice but to progress through three prior stages of industrialization and urbanization before they arrive at our state of grace, and even if they had the choice, that is what they would choose to do?”<sup>56</sup> The question becomes compelling when presented in the context of Fairlie’s detailed description of the ecological unsustainability of modern agricultural practices. Fairlie cites a more recent FAO report, *Livestock in*

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48. Slaughterhouse waste as feed has been complicated in developed countries by mad cow disease and foot and mouth disease. In Chapter 5, “The Plight of the Pig in the Nanny State,” Fairlie laments the waste involved in this policy. *See id.* at 44-54.

49. *See id.* at 37-38.

50. *See FAIRLIE, supra* note 1, at 38.

51. *Id.* at 39.

52. *See id.* at 39.

53. *Id.*

54. *See id.* at 39-40.

55. *See FAIRLIE, supra* note 1, at 40-43 (citing UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION, *LIVESTOCK’S LONG SHADOW* (2006), available at <ftp://ftp.fao.org/docrep/fao/010/a0701e/a0701e00.pdf> (last visited May 10, 2012)).

56. *Id.* at 41.

*the Balance*,<sup>57</sup> to point out that the consequences of intensive agriculture are not just ecological, but also sociological: Intensification of livestock production tends to undermine rural economies and cause emigration of rural people to urban areas, where “economic returns and spillover effects occur in the generally already better off urban areas.”<sup>58</sup>

### C. *The Permaculture Alternative*

*Meat* is not solely focused on the relative land (and water) requirements of livestock versus vegan agriculture. In Part II of the book, “Food Security,” Fairlie expands that discussion to deeper consideration of the causes of hunger and the prospect of a self-sufficient Britain. In Part III, “Energy and Carbon,” he examines the controversial claim by FAO that livestock produce more greenhouse gas emissions than transportation, and considers the carbon sink potential of grazing lands. In Part IV, “Land Use Change,” Fairlie imagines what different forms of agriculture could do with surplus lands. Readers interested in those questions will find detailed and entertaining treatment of them in *Meat*, though subject to similar limitations as those described above in the face of limited data.

In all of these discussions, Fairlie arrives at one conclusion: Considering all human and ecological needs as a whole – total energy requirements, total protein, energy production, GHG emissions reduction, open space, and even animal rights (albeit of a sort not inconsistent with eating them) – the most efficient form of agriculture is one that includes at least “default” livestock production. The final chapter, “Towards a Permaculture Livestock Economy,” is the author’s description of what this society might look like and why it matters.

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57. UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION, THE STATE OF FOOD AND AGRICULTURE: LIVESTOCK IN THE BALANCE; (2009), *available at* <http://www.fao.org/docrep/012/i0680e/i0680e.pdf> (last visited May 10, 2012).

58. FAIRLIE, *supra* note 1, at 41. Other studies of rural development have identified links between agricultural intensification, food retail concentration, rural-to-urban migration, and rural poverty. *See, e.g.*, INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT, RURAL POVERTY REPORT 2011 117-24, 153-56, *available at* <http://www.ifad.org/rpr2011/>, (last visited May 10, 2012); AXEL WOLZ, GLOBAL DONOR PLATFORM FOR RURAL DEVELOPMENT, THE ROLE OF AGRICULTURE AND RURAL DEVELOPMENT IN ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS – A JOINT NARRATIVE 14-20 (2005), *available at* <http://www.donorplatform.org/resources/library/article/20-aid-effectiveness/1244-the-role-of-ard-in-achieving-the-millennium-development-goals/166-Itemid.html> (last visited May 10, 2012); Lisa Pruitt, *Human Rights and Development for India’s Rural Remnant: A Capabilities-Based Assessment*, 44 U.C.-DAVIS L. REV. 803, 813-23 (2011) [hereinafter *India’s Rural Remnant*]; Lisa Pruitt, *Migration, Development, and the Promise of CEDAW for Rural Women*, 30 MICH. J. INT’L L. 707, 713-15 (2009) [hereinafter *Rural Women*].

In this vision, livestock play two critical roles that no machine can duplicate. First, they naturally mediate between competing land use priorities, for “where livestock are allowed to roam they bring grass,”<sup>59</sup> providing arable or grazing land to produce food, “and where they are excluded trees grow,”<sup>60</sup> thus providing fiber and energy. Second, animals “move nutrients from where they are not needed to where they are required,” eating grass and other biomass not edible by humans and delivering nitrogen and phosphorous in the form of manure.<sup>61</sup> Fairlie concludes that animals are more land-use efficient than acres of green manure crops because “they mop up nutrients from distant pastures and sparse hillsides and deposit them on arable land.”<sup>62</sup>

The mobility of animals is at the crux of this permaculture vision for a low-carbon future: “[T]he role played by animals in a low carbon permaculture economy to a large extent revolves around the fact that they can walk. God gave them legs, so they might as well use them.”<sup>63</sup> While animals’ mobility provides a presently under-appreciated source of energy and efficiency, the usefulness of this form of energy depends on reversing the industrial trend of separating humans (who need the energy) from animals and other natural resources (which supply it). The permaculture farmer can be distinguished from the vegan farmer, who views animal movement, digestion, and reproduction as waste, and the industrial farmer, who views them as costs. “The permaculturist . . . views animal energy as part of the natural cycle and tries to integrate it into the farming system, rather than using it as a reason for shutting the beast up in a factory, or ejecting it from the system altogether.”<sup>64</sup>

The permaculture system would differ from modern agriculture in a variety of respects, described throughout the book and reviewed by Fairlie in this chapter. For example:

- Farms would be diversified, growing a wider range of crops and raising different types of animals;

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59. FAIRLIE, *supra* note 1, at 273.

60. *Id.* Fairlie examines the historical relationship between pasture and forest in the U.K. in Chapter 16, “The Struggle Between Light and Shade.” *Id.* at 232-56. *See also id.* at 258-59 (discussing a U.K. land use model which allotted one quarter of the land least productive for food to woodland for timber and firewood uses).

61. *Id.* at 273. For a discussion of the relative efficiency of animal manure and “green manure” such as alfalfa or legumes in vegan agriculture, see Chapter 8, “The Golden Hoof and Green Manure.” *Id.* at 68-90.

62. *Id.* at 79.

63. *Id.* at 277.

64. FAIRLIE, *supra* note 1, at 278.

- Traction would be provided by biomass tractors or draught animals;
- Most pigs and some chickens would be kept close to houses and institutions and fed human waste;
- Slaughter would become more localized;
- More cows and goats would be hand-milked, and pasteurization would be unnecessary for locally-purchased milk;
- Milk production would be more localized, and milk deliveries might return to cities;
- Urban green space would be highly valued for gardening;
- Livestock markets and fairs would return to towns, and livestock might be driven to market on foot over some distances;
- Ruminants might be herded rather than fenced, and returned to barns or fields at night to supply manure;
- Food quality, nutrient-density and safety would improve as animals are moved out of highly concentrated facilities, animal value increases, and more human labor can be profitably devoted to each animal.<sup>65</sup>

Fairlie acknowledges (in characteristically humorous fashion) that this vision of a low-carbon society depends on a dramatic re-imagining of human settlement patterns. Cities and towns would not disappear, in this vision, but would become smaller as rural and pastoral alternatives become more attractive and energy constraints become more realistically accounted for.<sup>66</sup> Rather than “being off with the fairies,” as some readers might conclude in frustration, Fairlie argues that he is proposing a model whose sensibility might be attested to by the fact that humans had been following it for thousands of years and stopped doing so only about fifty years ago.<sup>67</sup> Moreover, the threat of climate change may make such quaintly sensible solutions more attractive in the near future. Concepts such as “food miles,” which only account for a fraction of the true costs of creating and moving food and fiber around,<sup>68</sup> miss the point: As long as people are separated from the food and fiber they actually consume, “it is not just a matter of food miles but ‘resource miles;’ and . . . we will just be tinkering around with this problem unless we find a way of siting people close to the resources that they use.”<sup>69</sup>

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65. *See id.* at 280-83.

66. *See id.* at 257.

67. *See id.* at 283.

68. For a none-too-sympathetic discussion of “food miles,” see Chapter 12, “Animal Furlongs and Vegetable Miles.” *Id.* at 151-58.

69. FAIRLIE, *supra* note 1, at 287.

### III. U.S. AGRICULTURE POLICY AS A TOOL FOR ENERGY REFORM

*Meat*, then, can be read as a challenge: In light of Fairlie's data analysis suggesting that we will run out of food and fiber, and the energy we use to create and move it, before or soon after the population hits nine billion, what are we going to do? The permaculture model, in Fairlie's vision, proposes to save energy by reducing the need for energy. Permaculture relies on the ancient solution of siting people close to what they consume, instead of mining minerals, sun, or wind (resources) to move food and fiber (resources) to the people.<sup>70</sup>

Is this a challenge the U.S. should accept? The calculations performed by Fairlie in *Meat* pertain largely to the U.K., which faces distinct agronomic and socio-political challenges compared to the U.S. Unlike the U.K., the U.S. is relatively sparsely populated in comparison with its total land mass.<sup>71</sup> Fairlie focused on the ability of the U.K. to feed itself, despite a \$33.3 million agricultural trade deficit in 2010.<sup>72</sup> By comparison, the United States in the same period had a \$35.8 million surplus in agricultural trade.<sup>73</sup> If we suppose the United States is feeding the world, does it make sense to steer U.S. policy toward less intensive production, default livestock levels, a more rural population, and a more labor-intensive form of agriculture?

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70. The long tenure of the solution is precisely its merit, in Fairlie's sharp-tongued but good-humored view: "Farmers have lived and worked like this with plants and animals for centuries, and it is arguable that advocates of permaculture have had to coin a new name only because industrial farmers have brought the term agriculture into disrepute." *Id.* at 278.

71. Fairlie's calculations are based on a U.K. population of 60.6 million people, with about 71,500 square miles (185,000 square kilometers) of agricultural land and about 14,250 square miles (36,900 square kilometers) of forested land, *see id.* at 94-95. Including urban land, the total land mass of the U.K. is about 94,000 square miles (243,600 square kilometers). *See The World Factbook: United Kingdom*, CIA, <https://www.cia.gov/library/publications/the-world-factbook/geos/uk.html> (last visited May 12, 2012). The United States, by contrast, has over 313 million people and almost 3.8 million square miles (approximately 9.8 million square kilometers). *See The World Factbook: United States*, CIA, <https://www.cia.gov/library/publications/the-world-factbook/geos/us.html> (last visited May 12, 2012). In 2010, the U.K. had a population density of more than 255 people per square kilometer, while U.S. population density was just over 32 people per square kilometer. *See World Population Prospects, the 2010 Revisions*, UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS (Jun. 28, 2011), <http://esa.un.org/unpd/wpp/Excel-Data/population.htm>.

72. *See Statistics: International Trade*, UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION, Table C3, <http://www.fao.org/economic/ess/ess-publications/ess-yearbook/ess-yearbook2010/yearbook2010-trade/en/> (May 12, 2012).

73. *Id.*

A. *Should U.S. Agriculture Move Toward a Permaculture Model?*

Whether the U.S. should move to a permaculture economy may be questioned both philosophically and empirically. First, on a philosophical level, several objections can be raised: Hunger is more a function of inequitable distribution than inadequate production,<sup>74</sup> so why should the United States redistribute food production between livestock and grain production when only a geopolitical transformation will truly eliminate world hunger?<sup>75</sup> And is it not paternalistic for U.S. agriculture to refuse to at least attempt to meet the rising demand for animal products from developing countries (especially while we ourselves eat more than half a pound of meat per day),<sup>76</sup> as implied by the FAO report, *Livestock's Long Shadow*?<sup>77</sup> Moreover, why assume that the U.S., rich in land and resources, should strive to feed the world at a sustainable level at all, rather than feeding ourselves at an optimal level?

Other objections are empirical: Even if the U.S. were to fully embrace the notion of using its resources with the aim of equitably supporting all of the world's people (present and future), some studies suggest that urban living is less resource-consuming and more welfare-generating than suburban or rural models.<sup>78</sup> Urbanization, it is argued, creates richer culture and more wealth<sup>79</sup> and offers more opportunity for women and

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74. See, e.g., AMARTYA SEN, *POVERTY AND FAMINES* 7 (1981).

75. Fairlie deals with this objection in Chapter 10, "On Granaries," see Fairlie at 106-18. The fundamental cause of hunger, Fairlie argues, is the displacement of subsistence agriculture with industrialized agriculture and market concentration. See *id.* When agriculture becomes a business and food becomes a commodity, people who have lost a subsistence way of life are also more likely to experience fewer of the benefits of the market system – and thus are unable to afford food in times of relative shortage. See *id.*

76. See FAIRLIE, *supra* note 1, at 21.

77. See *supra* note 55 and accompanying text.

78. See, e.g., EDWARD GLAESER, *TRIUMPH OF THE CITY* (2011) (demonstrating social, economic and environmental benefits and arguing for less restrictive regulation of urban development); Bruce Katz *et al.*, *Miracle Mets: How U.S. Metros Propel America's Economy and Might Drive Its Recovery*, BROOKINGS INSTITUTION (Mar. 11, 2009), <http://www.brookings.edu/research/articles/2009/03/11-metro-katz> (arguing for federal infrastructure investment at metropolitan, rather than state, level); *cf.* *How Should We Be Thinking About Urbanization? A Freakonomics Quorum*, FREAKONOMICS (Dec. 11, 2007), <http://www.freakonomics.com/2007/12/11/how-should-we-be-thinking-about-urbanization-a-freakonomics-quorum/> (posting comments from experts on pros and cons of urbanization) [hereinafter *Freakonomics Quorum*].

79. See *Freakonomics Quorum*, *supra* note 78 (comment by Edward Glaeser: "The spread of urbanization is, on net, an enormously beneficial process. People in cities are much more economically productive; urban density has been a wellspring of innovation for many millennia.").

girls;<sup>80</sup> high-density living also reduces land use costs and greenhouse gas emissions by concentrating people in smaller areas, thus increasing economies of scale in energy distribution and resource transportation that so worry Fairlie.<sup>81</sup> The permaculture response to the empirical objections is clear, if difficult to empirically verify: The permaculture model proposes a wholesale reallocation of human energy, not merely a substitution of status-quo rural life for status-quo urban life. Both lifestyles, urban and rural, currently are deeply shaped by decisions of the past century to separate people from resources and to consume fossil-fuel-based energy to bring them together. For instance, many studies finding cities to be “greener” than non-metropolitan areas compare cities either to suburban or peri-urban development or “sprawl.”<sup>82</sup> This alternative differs at least as much, if not more, from Fairlie’s permaculture society as does the modern metropolis. Others promote urban life in comparison to rural areas suffering from the effects of a century of urbanization combined with urban bias in public policy: rural-to-urban migration, pollution from intensive production agriculture, environmental impacts correlated with energy over-consumption (such as desertification and more frequent and intense storms), and neglect of sustainable rural development.<sup>83</sup> Today’s neglected

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80. See *State of World Population 2007: Unleashing the Potential of Urban Growth: Chapter 2*, United Nations Population Fund, [http://www.unfpa.org/swp/2007/english/chapter\\_2/womens\\_empowerment.html](http://www.unfpa.org/swp/2007/english/chapter_2/womens_empowerment.html) (last visited May 12, 2012) (identifying education, employment, property ownership, and community organizing, but not access to reproductive health services or lower fertility rates, as important drivers of well-being for poor women in cities) [hereinafter *Unleashing the Potential of Urban Growth*].

81. See Marilyn Brown et al., *Shrinking the Carbon Footprint of Metropolitan America*, BROOKINGS INSTITUTION, 15-17 (May 29, 2008), <http://www.brookings.edu/research/reports/2008/05/carbon-footprint-sarzynski> (stating the 100 largest U.S. metro areas account for two-thirds of the population and three-fourths of economic activity but only fifty-six percent of carbon emissions from highway transport and residential buildings); *Urbanization and Sustainability in the 21<sup>st</sup> Century*, in *Unleashing the Potential of Urban Growth*, *supra* note 80 (“Urban localities actually offer better chances for long-term sustainability, starting with the fact that they concentrate half the Earth’s population on less than 3 per cent [sic] of its land area.”).

82. See generally, e.g., *Urbanization and Sustainability in the 21<sup>st</sup> Century*, in *Unleashing the Potential of Urban Growth*, *supra* note 80.

83. See e.g., *The Social and Sustainable Use of Space*, in *Unleashing the Potential of Urban Growth*, *supra* note 80 (“Global urban expansion takes up much less land than activities that produce resources for consumption such as food, building materials or mining. It is also less than the yearly loss of natural lands to agricultural activities, forestry and grazing, or to erosion or salinization. . . . The protection of rural ecosystems ultimately requires that population be concentrated in non-primary sector activities and densely populated areas.”); see also *Rural Women*, *supra* note 58, at 725-



and struggling rural places are equally anathema to the permaculture vision of intensively-managed, closed-system agriculture, dignity of both human and animal labor, and policies that support both.

With regard to the conceptual objections, the choice of Fairlie's permaculture vision depends to a certain extent on values, not data: Should the U.S. seek to maximize domestic consumption or global equity?<sup>84</sup> Only the political process will determine whether U.S. policy will be guided by a government-led policy favoring global food sustainability, by a more free-market ethic, or something else. *Meat* offers a serious effort, however, to deal with agronomic and ecological realities that no conscientious policymaker or voter can ignore when considering food and energy policy. The first two philosophical objections raised above (distribution problems and paternalism) do not challenge the *value* of feeding the world, only the practicality of it or the appropriate means to accomplish it. Policy geared toward either of these goals must face the same limits that Fairlie's book grapples with: the carrying capacity of the Earth. While such a U.S. policy could take issue with some of Fairlie's calculations, it must consider (or at least attempt to replicate) such a serious effort to answer the question of how best to maximize use of the Earth's resources.

The third philosophical objection – that U.S. food policy can simply focus on feeding the U.S., not the world – has been complicated by the nature of modern environmental problems. The United States agriculture industry can provide ample food, including meat, for its citizens: In 2009, the U.S. meat industry produced nearly 275 pounds of meat per person, or enough for about three-quarters of a pound per person, per day.<sup>85</sup> This

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27 (discussing effect of "urban bias" in international development on agriculture livelihoods and rural lifestyles).

84. The U.S. government has previously expressed in international environmental negotiations that domestic prosperity and environmental conservation were in opposition, and that the U.S. would prioritize the former. Before the 1992 U.N. Conference on Environment and Development in Rio de Janeiro (the "Earth Summit"), President George H.W. Bush was quoted as saying, "We cannot permit the extremes in the environmental movement to shut down the United States on science that may not be as perfected as we in the United States could have it." Walter R. Mears, *Bush Vows Tough Stand in Rio Environment 2<sup>nd</sup> to Economy, He Tells Farmers*, MEMPHIS COMMERCIAL APPEAL, May 31, 1992. The statement came a day after the announcement that Bush would not sign the Convention on Biological Diversity being opened for signature at the Earth Summit. *Id.*

85. In 2009, the United States produced more than 38.2 million metric tons of beef, veal, pork, and broiler meat. See U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 861 (2012), available at <http://www.census.gov/compendia/statab/2012/tables/12s1376.pdf>. The U.S. population in 2009 was 307 million. 2009 World Population Data Sheet, POPULATION REFERENCE BUREAU, [https://www.prb.org/pdf09/09wpds\\_eng.pdf](https://www.prb.org/pdf09/09wpds_eng.pdf) (last visited May 12, 2012). The

production comes at a high environmental cost, however. For example, USDA reports that, “[i]n 1997, 68 counties had manure nitrogen levels that exceeded the assimilative capacity of the entire county’s crop and pasture land. Many more counties (152) had surplus manure phosphorus.”<sup>86</sup> These waste problems are associated with industrialized agriculture production. Of the 73 million U.S. acres devoted to concentrated animal feeding operations in 1997, USDA reports that the land had the capacity to assimilate as fertilizer only 40 percent of the manure nitrogen and 30 percent of manure phosphorus.<sup>87</sup>

Moreover, the threat of climate change from greenhouse gas emissions is an environmental game-changer. The United States Supreme Court took notice of the “significant harms” already attributable to climate change in its 2007 ruling, *Massachusetts v. Environmental Protection Agency*.<sup>88</sup> In considering whether Massachusetts had standing to bring suit against the EPA for failure to regulate auto emissions under the Clean Air Act, the Court noted that “[t]he harms associated with climate change are serious and well recognized.”<sup>89</sup> The Court noted that the National Research Council, which advises the U.S. government on scientific matters, “identifies a number of environmental changes that have already inflicted significant harms, including ‘the global retreat of mountain glaciers, reduction in snow-cover extent, the earlier spring melting of ice on rivers and lakes, [and] the accelerated rate of rise of sea levels during the 20th century relative to the past few thousand years.’”<sup>90</sup> Massachusetts established injury, the Court held, due to its ownership of extensive coastal lands: “If sea levels continue to rise as predicted, one Massachusetts official believes that a significant fraction of coastal property will be ‘either permanently lost through inundation or temporarily lost through periodic storm surge and flooding events,’ and “[r]emediation costs alone . . . could run well into the hundreds of millions of dollars.”<sup>91</sup>

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American Meat Institute reports that actual consumption was somewhat lower – 201.4 pounds per capita of poultry, fish, and red meat (including beef, veal, lamb, mutton, and pork). *Fact Sheet: U.S. Meat and Poultry Production & Consumption: An Overview*, AMERICAN MEAT INSTITUTE (July 2010), <http://www.meatami.com/ht/a/GetDocumentAction/i/63785>.

86. *Briefing Room: Environmental Interactions with Agricultural Production: Animal Agriculture and the Environment*, USDA ECONOMIC RESEARCH SERVICE, <http://www.ers.usda.gov/Briefing/AgAndEnvironment/animalagriculture.htm> (last visited May 12, 2012).

87. *Id.*

88. 549 U.S. 497 (2007).

89. *Id.* at 521.

90. *Id.*

91. *Id.* at 523.

The permaculture livestock economy described in *Meat* offers a lower-carbon alternative to the current model of “urban,” concentrated livestock production in the country, transported to urban, concentrated human consumers in the cities. As support for this alternative vision, Fairlie digs into the FAO report, *Livestock’s Long Shadow*, that reported higher greenhouse gas emissions from “extensive” (i.e., pastoral or grazing) livestock production than from “intensive” (i.e., concentrated) production.<sup>92</sup> In Fairlie’s analysis, FAO overestimated the amount of emission due to extensive livestock production primarily through two assumptions: First, all deforestation in the Amazon was attributed to extensive livestock production. The reasons for deforestation have as much to do with land speculation as with cattle grazing, and any such deforestation, Fairlie argues, should be counted as a one-time “capital” expenditure, not annual consumption from livestock operations.<sup>93</sup> Second, and perhaps more fundamentally for the permaculture model, FAO’s estimates for intensive livestock emissions fail to include the fossil fuel expenditures incurred “in order to accommodate its so called economies of scale.”<sup>94</sup> Fairlie’s accounting of those unattributed energy costs is colorful and illuminative:

4x4s, concrete yards, paved roads, electric lights, air conditioning, refrigeration, burglar alarms, slaughterhouse costs, animal waste disposal, health and safety measures, carcass incineration, livestock registration and identification, product tracking, computerized accounts, conferences, packaging, advertising, middlemen, retail chains, just-in-time delivery, supermarket journeys, processing waste disposal, domestic waste disposal, journeys to work etc.<sup>95</sup>

The permaculture society offers an alternative to the fossil-fuel-guzzling U.S. socio-economic model without resorting to a land-guzzling organic vegan model or a fossil-fuel guzzling chemical-fertilizer vegan model.<sup>96</sup>

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92. See FAIRLIE, *supra* note 1, at 176.

93. See *id.* at 161-67.

94. *Id.* at 178-80.

95. *Id.* at 179.

96. For a discussion of the relative land use impacts of vegan agriculture and permaculture, see Chapter 8, “The Golden Hoof and Green Manure.” *Id.* at 68-90.

### *B. Can U.S. Agriculture Move Toward a Permaculture Model?*

But is this alternative really “real?” Even assuming it makes sense ecologically and agronomically, how in the world would it work? At times, Fairlie’s vision of a re-populated countryside with a far more labor-intensive form of food, fiber and energy production sounds precisely like what human beings have voted against for the past century, by moving from the country to the cities. In the United States in 1910, there were 6.4 million farms; by 1997 there were 2 million, a nearly 68 percent decline.<sup>97</sup> In the early twentieth century, more than half the U.S. population lived in rural areas and 30 percent were employed in agriculture; today, 17 percent of Americans live in rural areas and only two percent make a living from farming.<sup>98</sup> Can Fairlie’s permaculture vision be achieved through anything but a Central Command reorganization of U.S. society?

The prospect of a more rural U.S. population more heavily employed in farming may be more realistic than the past century of urbanization suggests. As of 2007, beginning farmers (those with less than ten years of experience in farming) operated 22 percent of all U.S. farms.<sup>99</sup> Moreover, in a recent survey for the National Association of Realtors, forty percent of respondents said they would prefer to live in a rural area (22 percent) or small town (18 percent).<sup>100</sup> Rural population loss has been linked to lack of services such as schools and hospitals, and loss of natural amenities such as outdoor recreation areas, rather than to remoteness from urban areas or to rural poverty.<sup>101</sup> The moderately-populated pastoral settings within reasonable proximity to urban areas imagined by the permaculturist would fulfill some, if not all, of these conditions for attractive rural living.

Rural re-population on the scale that Fairlie envisions is still losing ground, however. Farming is an aging profession: In 2007, the average age of principal farm operators in the U.S. was 57.1, up from 50.3 in 1978, and

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97. SAMUEL R. STALEY, *THE SPRAWLING OF AMERICA: IN DEFENSE OF THE DYNAMIC CITY* 18 (1999), available at <http://reason.org/files/ed09db5e026808f5a16e1e56cf28aad3.pdf> (last visited May 12, 2012).

98. *About Us*, USDA NATIONAL INSTITUTE OF FOOD AND AGRICULTURE (Apr. 19, 2011), <http://www.csrees.usda.gov/q/links/extension.html>.

99. Mary Ahearn & Doris Newton, *Beginning Farmers and Ranchers*, USDA ECONOMIC RESEARCH SERVICE, 3 (May 2009), <http://www.ers.usda.gov/publications/eib53/>.

100. *The 2011 Community Preference Survey*, BELDEN RUSSONELLO & STEWART, LLC (March 2011), <http://www.brspoll.com/uploads/files/2011%20Community%20Preference%20Survey.pdf>.

101. See David A McGranahan & Calvin L. Beale, *Understanding Rural Population Loss*, *RURAL AMERICA*, 2 (Winter 2002), [http://www.ers.usda.gov/publications/rural\\_america/ra174/ra174a.pdf](http://www.ers.usda.gov/publications/rural_america/ra174/ra174a.pdf).

almost 30 percent of principal operators are 65 or older.<sup>102</sup> Beginning farmers and would-be farmers face significant barriers to entry, from both market and human failures. First, access to land, capital and credit is limited for beginning farmers. As one young farmer stated in a survey response, “[I]and prices are so high that large farms are getting larger and non-ag investors are pushing values higher. This makes purchasing land nearly impossible as it will not pay for itself.”<sup>103</sup> This anecdotal observation is supported by USDA research reporting that most farms that earned a profit in 2007 had sales of \$50,000 or more and had an average asset base of over \$1.9 million.<sup>104</sup> Although USDA reported that market entry for agriculture from 1978-97 was roughly equivalent to those for other industries,<sup>105</sup> those figures may not fully reflect barriers to entry for younger beginning farmers who will stay in the profession longer. For instance, USDA reports that beginning farmers as a whole (32 percent of whom were age 55 or older)<sup>106</sup> were less likely to rely on rented land than experienced farmers,<sup>107</sup> but a recent survey by the National Young Farmers’ Coalition showed that 70 percent of farmers under the age of thirty rented land, while only 37% percent over thirty did so.<sup>108</sup> In 1999, only 1.67 percent of farmland owners were under the age of 35, while 40 percent were over the age of 70.<sup>109</sup>

In addition to the endogenous market barriers to entry, at least for younger farmers and smaller-scale farms, evidence has mounted that would-be entrants to farming in recent decades have been excluded from the industry as a result of discrimination. USDA has recently settled lawsuits by African-Americans<sup>110</sup> and Native Americans<sup>111</sup> and offered a claims settlement process in relation to lawsuits filed by Hispanics and

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102. 2007 Census of Agriculture: Farmers By Age, USDA, [http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/usv1.pdf](http://www.agcensus.usda.gov/Publications/2007/Full_Report/usv1.pdf).

103. Lindsey Lusher Shute et al., *Building a Future with Farmers: Challenges Faced by Young American Farmers and a National Strategy to Help them Succeed*, YOUNG FARMERS, 25 (Nov. 2011), [http://www.youngfarmers.org/reports/Building\\_A\\_Future\\_With\\_Farmers.pdf](http://www.youngfarmers.org/reports/Building_A_Future_With_Farmers.pdf).

104. Ahearn & Newton, *supra* note 99, at 1.

105. *Id.* at iii.

106. *Id.*

107. *Id.* at iv.

108. Shute, *supra* note 103, at 25.

109. *Id.*

110. *See In re Black Farmers Discrimination Litigation (Pigford II)*, 820 F. Supp. 2d 78 (2011); *Pigford v. Glickman*, 182 F.R.D. 341 (D.D.C. 1998); *see also* Tadlock Cowan & Jody Feder, Congressional Research Service, *The Pigford Cases: USDA Settlement of Discrimination Suits by Black Farmers* (June 14, 2011).

111. *See Keepseagle v. Veneman*, 2001 U.S. Dist. LEXIS 25220 (D.D.C. Dec. 11, 2001).

women,<sup>112</sup> alleging that USDA discriminated against the plaintiffs when they sought access to programs and benefits for farmers or those seeking to begin farming.<sup>113</sup> Moreover, a recent survey showed that young farmers seeking assistance from USDA's Farm Service Agency report that FSA personnel lack incentives to provide adequate assistance in processing applications for small loans or to inform young farmers about USDA programs for beginning farmers and ranchers.<sup>114</sup>

Recent U.S. farm policy, however, has recognized and sought to introduce programs to overcome some of these market failures that prevent new farmers from entering the industry. The 2008 Farm Bill evidenced rapid growth in new programs aimed at beginning farmers and ranchers, as well as socially disadvantaged farmers and ranchers.<sup>115</sup> These programs are sprinkled throughout the different titles of the Farm Bill. For example:

- Conservation Title: offers two years of additional Conservation Reserve Program (CRP) payments for participants returning retired land to production if the land is sold or leased to beginning or disadvantaged farmers or ranchers;<sup>116</sup> allows beginning farmers to receive up to 90 percent cost-share for improvements made with Environmental Quality Incentives Program (EQIP) and Conservation Stewardship Program (CSP) funds;<sup>117</sup>
- Credit Title: increases percentage of total loan funding reserved for beginning farmers and ranchers,<sup>118</sup> and allows any farm experience,

112. See Mary Clare Jalonick, *USDA Offers Settlement to Women, Hispanic Farmers*, THE WASHINGTON POST (Feb. 25, 2011); see also *Love v. Johanns*, 439 F.3d 723 (D.C. Cir. 2006) (denying class certification); *Garcia v. Vilsack*, 563 F.3d 519 (D.C. Cir. 2009) (on appeal of consolidated *Garcia* and *Love* actions, denying claim for review under APA in light of special remedy created by Congress), *cert. denied*, 130 S. Ct. 1138 (2010).

113. See generally JODY FEDER & TADLOCK COWAN, CONG. RESEARCH SERV., R40988, *GARCIA V. VILSACK: A POLICY AND LEGAL ANALYSIS OF A USDA DISCRIMINATION CASE* (Dec. 2010), available at <http://www.nationalaglawcenter.org/assets/crs/R40988.pdf>.

114. See Shute, *supra* note 103, at 23.

115. See Suresh Sureshwaran & Stephanie Ritchie, *U.S. Farm Bill Resources and Programs for Beginning Farmers*, CHOICES, 26 (2011), <http://www.choices-magazine.org/choices-magazine/theme-articles/innovations-to-support-beginning-farmers-and-ranchers/us-farm-bill-resources-and-programs-for-beginning-farmers->

116. See *id.*; see also Ahearn & Newton, *supra* note 99, at 15.

117. See Ahearn & Newton, *supra* note 99, at 15.

118. See Sureshwaran & Ritchie, *supra* note 115; see also Ahearn & Newton, *supra* note 99, at 14 (reserved 50 percent of direct operating loans and 75 percent of direct farm ownership loans for beginning farmers through September 1 of each fiscal year).

no matter when it occurred, to be counted toward meeting three-year farm management experience eligibility requirement for farm operating loans;<sup>119</sup>

- Rural Development Title: dedicates 10 percent of Value-Added Agricultural Product Marketing Development Grants for projects benefitting beginning and socially-disadvantaged farmers and ranchers;<sup>120</sup>
- Research Title: Reauthorized and, for the first time, funded the Beginning Farmer and Rancher Development Program for competitive grants with mandatory funding of \$75 million for fiscal years 2009-2012.<sup>121</sup>

Whether these provisions will be reauthorized and refunded in the 2012 Farm Bill, however, is a matter of conjecture. During the meetings of the congressional supercommittee in late 2011, lawmakers on the House and Senate Agriculture Committees attempted to craft what has been called a “secret farm bill,” with about \$23 billion in budget cuts.<sup>122</sup> While details of the secret bill are not publicly available, knowledgeable sources have reported that the “Secret Title II” or Conservation Title of the Farm Bill would have cut \$6.3 billion from CRP (\$3.8 billion), CSP (\$2 billion) and EQIP (\$1.9 billion).<sup>123</sup> While the secret farm bill would have continued the Beginning Farmer and Rancher Development Program, albeit at less than current funding levels,<sup>124</sup> it would have discontinued the Outreach and Technical Assistance for Socially Disadvantaged Farmers and Ranchers

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119. Sureshwaran & Ritchie, *supra* note 115.

120. *Id.*

121. *Id.*

122. See Erik Wasson, ‘Secret Farm Bill’ Primed for Passage in Debt Deal, THE HILL (Nov. 15, 2011), <http://thehill.com/homenews/house/193581-secret-farm-bill-primed-for-passage-in-debt-deal>.

123. See *The Farm Bill Is Dead! Long Live the Farm Bill! – Part Two*, NATIONAL SUSTAINABLE AGRICULTURE COALITION (Nov. 22, 2011), <http://sustainableagriculture.net/blog/2011-farm-bill-rip-part-two/> [hereinafter *Farm Bill*]. The proposed cuts from the three programs exceed the \$6.3 billion mark because the EQIP cut includes the cut resulting from its absorption of the Wildlife Habitats Incentives Program (WHIP), which is not broken out separately. See also Mark Bittman, *The Secret Farm Bill*, N.Y. TIMES, Nov. 8, 2011.

124. See *Farm Bill*, *supra* note 123. The supercommittee bill would have cut the program from \$75 million to \$50 million, far below the \$125 million proposed in the Beginning Farmer and Rancher Opportunity Act, a bill introduced in the Senate by Tom Harkin and in the House by Tim Walz and Jeff Fortenberry. *Id.* See also Senate Champions Introduce Beginning Farmer Bill, NATIONAL SUSTAINABLE AGRICULTURE COALITION (Nov. 10, 2011), <http://sustainableagriculture.net/blog/senate-bfr-bill-intro/>.

Program, which makes grants to groups that assist minority farmers in acquiring, owning, operating, and retaining farms and ranches and equitably participating in USDA programs.<sup>125</sup> Other programs on the chopping block in the supercommittee bill that would support Fairlie's vision of a permaculture economy included (from the Rural Development Title) the Value-Added Agricultural Marketing Development Program, which funds local and regional supply networks between independent producers and businesses or cooperatives,<sup>126</sup> and the Rural Entrepreneur and Microentrepreneur Assistance Program, which assists very small and economically disadvantaged businesses.<sup>127</sup> The supercommittee bill would also have cut funding for the Rural Energy for America Program, which assists rural communities and businesses in becoming more energy-efficient and self-sufficient.<sup>128</sup> Since the supercommittee bill did not pass, the House and Senate Agriculture Committees will negotiate amendments to the Farm Bill through the more conventional process in 2012 or 2013.<sup>129</sup> Whether lawmakers will begin with the supercommittee bill as a draft or start over remains unclear.

#### IV. CONCLUSION: MAKING PERMACULTURE A PART OF THE U.S. ENERGY SOLUTION

*Meat* painstakingly presents an intriguing alternative for a society looking for a way out of fossil fuel dependence – one that does not depend on new technologies or complex renewable energy infrastructures. Can the 2012 Farm Bill transform U.S. society from one of big cars, big machines, and big emissions, to one where peaceful farmers sucking on straw drive contented cows on foot from their well-kept fields to nearby village fairs, where both farmer and animal will receive a fair value for their contributions?

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125. See *Farm Bill*, *supra* note 123.

126. For more information, see TADLOCK COWAN, CONG. RESEARCH SERV., RL34126, RURAL DEVELOPMENT PROVISIONS OF THE 2008 FARM BILL (Jan. 16, 2009), available at <http://www.nationalaglawcenter.org/assets/crs/RL34126.pdf>.

127. See *id.*

128. See *Farm Bill*, *supra* note 123. For more information on REAP, see MEGAN STUBBS, CONG. RESEARCH SERV., RL34130, RENEWABLE ENERGY PROGRAMS IN THE 2008 FARM BILL (Dec. 20, 2010), available at <http://www.nationalaglawcenter.org/assets/crs/RL34130.pdf>.

129. See UNITED STATES COMMITTEE ON AGRICULTURE, NUTRITION AND FORESTRY, <http://www.agriculture.senate.gov/> (last visited May 12, 2012); Press Release, House Committee on Agriculture, Ag Committee Moves Forward with Farm Bill Process and Announces DC Hearings (Apr. 18, 2012), available at <http://agriculture.house.gov/press/PRArticle.aspx?NewsID=1564>.



Well, no. But such all-or-nothing solutions are rarely necessary to produce rational policy shifts or even dramatic ones. In a seminal work on climate change policy, Stephen Pacala and Robert Socolow broke that seemingly intractable problem into somewhat more manageable-size chunks, called “stabilization wedges,” each representing one-seventh of the emissions reduction projected necessary to stabilize carbon emissions below double pre-industrial levels within fifty years.<sup>130</sup> Pacala & Socolow noted that “[i]mprovements in efficiency and conservation probably offer the greatest potential to provide wedges.”<sup>131</sup> For example, the authors estimate that one wedge could be achieved if average automobile fuel economy were 30 miles per gallon, but annual distances traveled were cut in half; another could be achieved if miles traveled remained the same but fuel economy rates were doubled.<sup>132</sup> The authors acknowledged, however, that efficiency and conservation standards are “less tangible” than reductions from other sources, because they depend on hundreds of different innovations from many sources.<sup>133</sup> For comparison, the authors calculate that at least one-half of a stabilization wedge could be realized by eliminating clear-cutting of primary tropical forests instead of cutting it by half (as projected in the business-as-usual scenario), or by extending conservation tillage and verified soil management plans to all cropland.<sup>134</sup>

Fairlie’s permaculture model, even if only partially realized, is consistent with the focus on energy efficiency and conservation that Pacala & Socolow consider the most promising way to realize meaningful progress toward climate stabilization. Recall Fairlie’s list of the hidden fossil fuel costs associated with industrial animal production – “4x4s, concrete yards, paved roads, electric lights” and so on.<sup>135</sup> Now imagine that U.S. agriculture and rural development policy succeeded in attracting new farmers (even 500,000 new rural residents would be more than the number of beginning farmers as of 2007),<sup>136</sup> and supporting desirable rural communities, diversified farms and local and regional food systems. With even such incremental changes in settlement patterns and food production methods, it is not a wild stretch to imagine (though imprecise to calculate) how the exponential effects of saved energy from food, fiber and energy

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130. See Stephen Pacala & Robert Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 SCIENCE 968, 968 (Aug. 13, 2004).

131. *Id.* at 969.

132. *See id.*

133. *See id.*

134. *See id.* at 971.

135. FAIRLIE, *supra* note 1, at at 179.

136. *See* Newton & Ahearn, *supra* note 99 at 7, 14-15.

transport could meaningfully contribute to one of Pacala & Socolow's stabilization wedges. Moreover, a permaculture society could contribute to other stabilization wedges as well, such as improved forest and soil management.<sup>137</sup> Combined with the other initiatives identified by Pacala & Socolow that will undoubtedly continue to be pursued as well, such as more efficient buildings, improved power plant efficiency, carbon capture and storage, wind and solar energy,<sup>138</sup> Fairlie's permaculture vision looks less like a flight with the fairies than a viable pillar in a comprehensive energy-efficiency re-engineering of U.S. society.

To move toward a more energy-efficient society through permaculture, U.S. agriculture policy will need to focus on three key areas: First, government programs should seek to remove market barriers to entry by beginning farmers and ranchers through programs like those mentioned above. Second, policies should help to offset capital costs for conversion to more diversified and management-intensive forms of agriculture through programs such as EQIP and Value-Added Producer Grants. Finally, government should seek to support the services and amenities that attract both farmers and non-farmers to rural areas. This can be accomplished through rural development programs such as rural business loans and rural broadband service, as well as through enforcement of environmental laws designed to protect natural resources. If Fairlie is correct, the fact that support for such programs will lead to more total food for the planet and a better quality of life for rural Americans is only the beginning. The implications of the permaculture vision are much broader, proposing an important wedge in the pie of a more rational pattern of energy consumption, and helping to stave off an energy crisis or climate-related environmental calamity. Given the worrisome projections for continuing with the urban experiment of the Industrial Era, the permaculture solution of re-connecting people with resources deserves serious policy attention in the next Farm Bill and beyond.

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137. For a discussion of soil as a carbon sink, see FAIRLIE, *supra* note 1, at 188-210.

138. See Pacala & Socolow, *supra* note 130, at 970.

