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Sustainable Design
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Local vs. Organic

There is perhaps no field in which the issue of sustainability is greater than in agriculture. The globe's citizens are tied together not only by agriculture's environmental impacts, but also by their dependencies upon its products. No person is capable of living, nor culture capable of surviving, without effective agricultural systems.

Ideologically, determining what constitutes an effective agriculture system is not difficult (Smith and McDonald, 1998). The ideal farm should yield abundant, tasty produce without draining the environment of its resources or causing damage to outside ecosystems, and farm laborers should be rewarded by both the nature and the outcome of their work. Additionally, the generation of abundant produce should translate into economic wealth which in turn allows for the growth and development of culture. Essentially, "food sufficiency, environmental stewardship, socio economic viability and equity" (Smith and McDonald) are the four supporting pillars to the ideal superstructure of sustainable agriculture.

To put these ideals into practice, however, is a feat humanity has yet to achieve, despite some 10,000 years of trying. This is not to say that humanity has failed to make big changes; the 20th century saw incredible increases in agricultural yields thanks to Fritz Haber[1] and Norman Borlaug[2]. On top of this, economic systems have grossly ballooned, bringing Chilean grapes to Pennsylvania, California Wine to Paris, France, and European milk to Mongolian markets (Norberg, 2003; Cloud, 2008; Smith et Al, 1998; Locavores.com).

These significant changes—the use of industrial inputs and increased mechanization to raise productivity combined with the global scope of agricultural trade—define the most prevalent of current agricultural systems, headlined as conventional agriculture (Rigby, 2001; Cloud, 2008). While this system has substantially increased food yields, it has been heavily criticized for the deleterious effects it has on the environment and social-cultural systems. Industrial agriculture "has come to draw the

[1] Inventor of the Nitrogen Fixation process, commercialized by Carl Bosch in 1910.

[2] Father of "The Green Revolution,"

inputs which it uses from more distance sources,…to derive an increasing proportion of its energy supplies from non-renewable sources… and to have an increasing impact on the environment (Hodge, 1993, p. 3)." Run-off of fertilizer is responsible for the creation of hypoxic zones in lakes and oceans, and synthetic pesticides kill more than their targeted organisms (Rigby et al, 2001; Williams et al, 2006). The use of heavy machinery and tillage has negative impacts upon soil quality, and the costs of non-renewable inputs are unaccounted for on supermarket shelves (Cloud, 2008; Rigby et al, 2001; Norberg, 2003). The cheaper foods produced by monocultures are infiltrating markets and forcing small farms give up their livelihoods, effectively destroying cultures while forcing people to become more and more dependant upon the same food resources; "globalization creates efficiency for corporations, but it also creates artificial scarcity for consumers, thus heightening competitive pressures (Norberg, 2003)."

The increased yields of industrial agriculture have come with serious trade-offs in terms of sustainability. The western world, concerned by the implications, has thus responded with the advent of two food movements now vying for the public's attraction; organic, and local. Both are perceived as being significant improvements over industrial agriculture. They claim to be better in terms of taste and health effects, to be more environmentally friendly, more economically viable for farmers, and most importantly, more sustainable.

Despite similarities in perceived benefits however, organic and local are not synonymous movements. So the question for the consumer then, is what constitutes the differences between the two movements, and which does a better job of obtaining the sustainable agricultural ideal?

Organic: Isn't That Every Carbon Based Organism?

Organic Farming is a relatively old movement. The term was coined in 1940 to advocate a well-rounded, holistic, natural approach to farming as opposed to the synthetic, linear systems that were redefining agriculture (Riby and Caceres, 2001; Cloud, 2008). Initially, the organic movement was very similar to the local movement seen today; there was a call to return to more localized systems, to bring back tiny farming communities and a face-to-face relationship between grower and consumer

(Cloud, 2008; Smith et al, 1998). However, as the movement has aged, it has become more and more focused on farm inputs rather than distance and size. A modern definition is "…production systems which maximize reliance on farm-derived renewable resources and the management of ecological and biological processes and interactions (Lampkin, 1994 p. 5)."

The movement today primarily revolves around the notion that the synthetic inputs conventional crops rely upon are dangerous for both human and environmental health; the concept that human health in particular is at risk is propagated through affluent social circles, where organic is touted as a cancer preventative and cure (Cloud, 2008; Smith et al, 1998; Magkos et al, 2006). The consumer's need to verify the chemical-free nature of organic has resulted in a particularly unique feature—organic agriculture is heavily regulated, with specific practices and acceptable chemical levels being well-defined by food regulation industries, such as the USDA (Rigby et al, 2001; Magkos et al, 2006). While exact standards vary from country to country, the chemical free ideals are very similar.

In terms of animal husbandry, ethics is as much a part of the movement as chemical free (Cloud, 2008; Rigby et al). Animals are not to be fed any animal by-products and are required to have access to the outside; additionally, "Animal health in organic systems should be maintained and promoted mainly through preventive measures, including appropriate selection of breeds and strains, balanced high quality diet, and favorable environment especially with respect to animal density (Magkos, Arvaniti, and Zampelas, 2006)."

A plethora of food scares, in particular the Mad-Cow "epidemics" of the 1990s, have lead to "the rapid development of the organic sector in Europe and North America (Rigby and Caceres, 2001)." The United States is seeing extreme growth in organic agriculture. In 1999, consumers spent approximately 6 billion dollars on organic products (Rigby et al, 2001).

For many, organic agriculture is equated to sustainable, and indeed the movement initially began in response to a food system growing less and less concerned with environmental stewardship. However, many are beginning to criticize the organic label as having lost touch with the values it was initially founded on (Cloud, 2008; Rigby et al,

2001, Magkos et al, 2006). More specifically, some feel that organic farming is only sustainable "if nonsustainability is identified through the use of non-renewable resources, especially inorganic chemicals (Rigby et al, 2001)."

All farming is dependant upon successful yields, and obtaining a good yield of produce without use of synthetic chemical inputs can be exceeding difficult. For instance, wet, humid climates find it extremely difficult to prevent the growth of mold, mildew, and funguses without synthetic fungicides (Rigby et al, 2001; Magkos et al, 2006). Organic farming requires many more farm hands, many more hours of labor, and also many more acres of land (Williams et al, 2006; Smith et al, 1998).

As a result, organic farming fails to be particularly less capital intensive than conventional farming. Even adhering to organic regulations and becoming organic-certified requires capital—regulations require that farms that once practiced conventional agriculture lay fallow for a certain period before they can produce certified organic produce (Rigby et al, 2001; Williams et al, 2006). Only farmers who can afford to wait on fallow land for several years can therefore make the switch, and that means that the majority of farmers going organic are industrial; even as family farms are being lost at incredible rates; "the number of organic farmers is increasing at a rate of about 12% a year (Rigby and Caceres, 2001)."

Overall, industrial organic requires less energy than conventional produce, but not by nearly enough to make it environmentally sustainable. Some organic products are actually more energy intensive—"organic poultry meat and egg production increase energy use by 30% and 15% respectively (William et al, 2006)." In Europe, tomatoes are frequently grown in greenhouses in order to extend the growing season. Since organic tomatoes are much lower yielding, it therefore takes considerably more energy per tomato. "The lowest yielding organic, on-the-vine, specialist tomatoes incur about six times the burden of non-organic, loose classic (Williams et al, 2006)."

Organic animal herds take a considerable toll on the land, particularly since many of the industrial-organic farmers, many of whom have switched to organic to take advantage of it's high prices, still push animal density beyond what the land can handle. Organic beef and pork can have devastating effects on soil conservation and quality.

Overgrazing exposes soil to wind and rain, and pigs in particular will dig through dirt to expose their favorite roots, seeds, and nuts (Magkos et al, 2006; Rigby et al, 2001).

More important is that energy consumption isn't the only factor affecting environmental sustainability. An LCA analysis of several food products—wheat, tomatoes, potatoes, chicken, beef, pork, sheep, eggs, milk—revealed that the majority of organic versions actually had worse environmental impacts than their conventional equivalents (Williams et al, 2006). Stated in the list of conclusions from the study is "the relative burdens of GWP [Global warming], acidification potential and eutrophication potential between organic and non-organic field-based commodities are more complex than energy and organic production often incurs greater burdens (Williams et al, 2006)."

Socially, organic also fails to outdo its conventional counterpart. Despite its recent industrialization, its low yields combined with its equally capital intensive nature make for high priced products inaccessible to those with limited finances (Cloud, 2008; Rigby et al, 2001). Its social equity is also compromised by the fact that industrial organic fails to address food security issues. An example is presented by an anecdote from Germany: a huge recall of organic poultry products was issued when the products were discovered to have been contaminated with synthetic pesticide. The organic grain to feed the animals, while grown in 100% accordance with organic standards, was shipped to a distribution center where it was stored in a "depot, which, up to 1990, had been used for storing…nitrofen, DDT, lindane and Methoxichlor (Magkos et al, 2006)." It should be clarified that this is not a problem specific for organic, but rather to industrial food in general; anytime food much be gathered in large quantities at central distribution points it risks the potential for contamination (Magkos et al, 2006).

All in all, organic farming fails to be particularly sustainable. Economically, it favors wealthy farmers and is no more viable than conventional agriculture for small farms. Its environmental benefits stop beyond the benefits from the lack of synthetic inputs, and though it typically generates good quality food, this food is largely inaccessible to the those within the lower economic rungs of society.

Local: Of Course my Supermarket is Within 100 Miles

Local food is the oldest of food alternatives, since up until recently local food was the only food available. Today, however, foods regularly come from far, far away. Locavores.com states, "Our food now travels an average of 1,500 miles before ending up on our plates…much of the food grown in the breadbasket surrounding us must be shipped across the country to distribution centers before it makes its way back to our supermarket shelves (Locavores.com, 2008)."

Proponents of the local movement feel the "organic" label to be rather meaningless if the shipping and packaging methods are the same as products conventionally grown. As far as they are concerned "globalization of the food supply has serious consequences for the environment, our health, our communities and our tastebuds…[and] because uncounted costs of [globalization] (air pollution and global warming, the ecological costs of large scale monoculture, the loss of family farms and local community dollars) are not paid for at the checkout counter, many of us do not think about them at all (locavores.com, 2008)."

John Cloud recently commented in his time article "Eating Better Than Organic" that many organic foods fail to state where the food is grown; despite the numerous organic regulations, specifying exactly how far a food has traveled isn't one of them. For environmentalists, this is outrageous. No matter how much better an organic farm may be in terms of environmental health, if a food requires highways, trucks, airports and planes to transport it, in addition to factories to process and package it, it's still bad for mother earth and human health.

The globalization of food is also beginning to show serious affects on small economies, while it effectively concentrates wealth in the hands of a few large producers. "As more and more land is swallowed up into industrial agribusiness, small farmers are pushed off the land and people's access to food is threatened…local food becomes quite scarce (Norberg-Hodge, 2003)." Despite Borlaug's good intentions with the development of his high-yielding varieties, the agricultural methods he thought would save world hunger have effectively undermined local markets and made it impossible for small land owners to continue to make a viable livelihood of farming. The worst,

however, would be the changes globalization has made in terms of food access "today, when food is more tightly controlled by corporations than ever before, some 790 million people are undernourished (Norberg-Hodge, 2003)."

Local food, therefore, fights against globalization by sticking hard to the old principles of organic—agricultural communities made up of many small farms serving the immediate, surrounding population. The movement is largely grassroots oriented, and a peruse of the world wide web reveals many different groups set out to spread the good word about eating local produce (Cloud, 2008; Macias, 2008; locavores.com.

One group, The Locavores (the term was recently added to the Oxford dictionary) invite anyone who cares to try to attempt to eat within a 100 mile radius of their home. For the locavores, this is undoubtedly a little easier than it is for some; the locavore homebase is San Francisco, CA, where produce of all sorts is abundant year round. Jane Gussow, a prodominent journalist who has advocated local for decades now, suggests all food come from within "a leisurely day's drive (Cloud, 2008)."

Regardless of the exact number or definition of local, all local advocates agree "Recognition of one's residence within a foodshed can confer a sense of connection and responsibility to a particular locality. The foodshed can provide a place for us to ground ourselves in the…social realities of living on the land and from the land (Locavores.com, 2008)." The local movement is firmly cemented in a philosophy of food culture (Macias, 2008; Locavores.com; Cloud, 2008).

However, perhaps the most unique aspect of the local movement is that it tends to be fairly pragmatic compared to most other alternative eating styles (Locavores.com; Cloud, 2008). For one, the number one reason stated to go local is taste—foods that are grown in season and travel less tend to be fresher and, well, tastier. For another, the local movement is well aware that people have been going out of their way to trade foods for ages. Salt, spices, coffee and sugar are four foods that have always traveled miles to reach their consumers. This isn't to say that all local proponents continue to use these foods, but that there's no sense of elitism towards those who do; the idea is to get people thinking about where their food comes from, and what effects food has upon people's environments and cultures (Locavores.com; Macias, 2008; Cloud, 2008).

The local movement has been steadily growing in popularity, and more and more local produce is being found in supermarkets. Overall, however, supermarket chains are an extremely minor form of local distribution (Cloud, 2008; Macias, 2008). Indeed, local farmers tend to be a bit more dedicated to the preservation of the earth and its resources, and on principle are not attracted to distributing their produce through big-box chains. This used to be the case with organic farmers, but now more and more farmers have sought ought organic certification to reap the benefits of pricey organic produce as opposed to helping benefit the planet (Cloud, 2008; Magkos et al, 2006).

There are three main distribution methods for local food: Community Supported Agriculture groups, farmer's markets, and community gardens. Interestingly, each group seems to appeal to a different socio-economic class, based on the differences between the three methods (Macias, 2008).

CSAs work like co-ops: families interested in either picking up or having local produce delivered to their homes pay a certain fee at the beginning of the season to a group of farmers. The farmers then distribute whatever they grow accordingly. Most of the participants within these plans tend to be affluent, white, and representative of the adult portion of the nuclear family. CSAs tend to be somewhat clickish—to keep down on costs, they don't do much advertising, and more often than not knowledge of them is spread through word of mouth. There are websites where CSAs submit contact info, and consumers can look them up that way but this still requires a computer, internet, and the education that such a program exists. For families without these things and also lacking with the somewhat large sums required upfront (prices to participate in a CSA can range from a couple hundred to more than a thousand dollars) CSAs are not an attractive option. For those with such resources, however, they can work out quite nicely. There's a particular attraction for families too; having the produce delivered can save a trip to the grocery store, and even if the produce has to be picked up children tend to prefer the friendly, outdoor atmosphere of the CSA distribution points (Macias, 2008; Cloud, 2008).

Farmers Markets tend to do a somewhat better job of obtaining social equity than CSAs. For one, distribution centers are usually placed in busy, frequented areas and therefore their presence serves as their own form of advertising. However, the markets do follow the consumers most attracted to their produce, and they are more likely to be

found in relatively affluent areas (think Rittenhouse Square versus Clark Park) than in low-income neighborhoods. Nonetheless, there is much more diversity among the frequenters of farmer's markets than the groups that participate within CSAs. There are significant attempts being made to help bring markets into low-income areas. Vermont state, for instance, has a Family-to-Farm subsidy plan, where farmers receive grants to sell their produce at low costs in working class areas. Farmers also receive breaks for donating excess produce to community food banks (Macias, 2008; Cloud, 2008).

Community Gardens are becoming more and more common, and are frequently touted as ways of helping to bring pride into lower-class areas. However, many families fail to have the time required to invest within a community garden, and the same is true for individuals working long hours for limited wages. Nonetheless, community gardens continue to grow as a way for people to provide their own local food and provide a very interesting way for people to socialize within their communities (Macias, 2008).

While local is still not completely socially equitable, it certainly does a better job than organic produce which is hardly accessible to the working class. Industrial food is more accessible than both to the working class, but because of the health risks it poses due to its typical high-fat and low nutrient content, is not exactly equitable either. Social equity is a particular challenge for food, because it is exceedingly hard to find good, cheap food that is not incredibly time-consuming (Norberg-Hodge, 2003; Macias, 2008; Smith et al, 1998).

However, in terms of economic and environmental sustainability, local outdoes both organic and conventional by a long-shot. It reduces food miles quite considerably, and local farmers tend to have the most sustainable growing practices (Cloud, 2008; Macias, 2008; Locavores.com). Many strong proponents of organic find this concept to be outrageous; after all, if local lacks the regulation to ensure farmers aren't using dangerous synthetic inputs, than how can any consumer be sure their food is safe?

There are two answers. The first is rather complex. Basically, organic also doesn't necessarily denote a total lack of chemical input. It specifies, rather, that synthetic, often petroleum based products, are prohibited from use. However, some natural "-cides" are allowed on organic farms. The concept is that their farm-derived nature ensures their safety, but the truth is that many of these natural cides are just as

dangerous as their synthetic counterparts. Nicotine, for instance, is a natural pesticide permitted in organic production[3], and copper salts and sulfates are used to prevent fungus and mold. Some of these products may break down more readily, but they also tend to be less effective, and therefore are sometimes used in very excessive quantities. Just as most vitamins have a toxic threshold, so do these natural products. What exactly the toxic dose is, however, is unclear since there's been little research done. Interestingly, "the Reduced Risk Program for the US Environmental Protection Agency applies for synthetic pesticides only, and does not include biological ones (Magkos et al, 2006)." This is incredibly ironic, given the intense regulation revolving other aspects of organic, and also considering that consumer fear of chemicals is the number one reason people choose organic (Magkos et all, 2006; Smith et al, 1998; Rigby et al, 2001).

The second answer is a bit more user friendly, particularly because it helps to explain why the local food movement seems to have so much more success despite having been founded on very similar principles compared to organic. It's also an answer that is, in some ways, very obvious—consumers know local food is safe because they know where and how their food is grown (Locavores.com; Cloud, 2008; Macias, 2008).

The local food movement is all about re-incorporating food and food production into culture. Science can help us to determine what's safe and not safe, but ultimately depending on time-consuming, expensive research and many times conflicting reports is not practical for most consumers (Norberg-Hodge, 2003; Cloud, 2008; Rigby et al, 2001). This is especially true because regardless of what science tells us, most people are much more likely to follow their tastes and intuitions than excel plots generated by more distant figures.

More importantly, sustainable practices are not universal; what is sustainable in one time and place is not necessarily sustainable in a different time and place or even a different place at the same time or vice versa. "The complex nature of the interrelationships between agricultural production and the natural environment means that we are far from knowing which methods and systems in different locations with lead to sustainability (Rigby et al, 2001)." The same is true for health as well—individual's

[3] At least up until 1996, the date of this information source. The source also did not specify if this practice depends on country specific organic regulations.

constitutions, genetics, and lifestyles largely affect what is good for them (Magkos et al, 2006). This is actually one more reason to eat local—what grows in the climate that best supports a person is likely to be best for their body as well.

Surprisingly, it would seem the best way to determine what's sustainable and what's not is to keep food tied to us through culture, and that's exactly what local food does. Now, the consumer can base their decisions off what they see visiting the farm to pick up their produce, looking the farmer in the eye at market, or hearing about his practices through fellow participants (Cloud, 2008; Macias, 2008).

Culture was teaching us what constituted good and bad long before regulatory agencies and scientific experiments. At this point, we're still working out the kinks concerning the latter two, so we're still in deep need of culture to help us determine the good from the bad. Conventional and Industrial Agriculture have only been depending upon agencies and science, and ultimately they're not nearly as sustainable as we need them to be.

Local food, on the other hand, is far more environmentally and economically sustainable. Its environmental sustainability is maintained because local farmers can exercise more autonomy over their practices than farmers who must constantly shift their practices to adjust to unstable global economies or regulation. Local farmers are also more motivated to practice good environmental stewardship because this greatly impacts whether or not consumers are drawn to their produce. Economically, local food keeps money local too, which is good for the local economy, and small farms find it easier to maintain profitability when working in local systems too.

This isn't to say organic is terrible, but rather than the narrow minded focus on synthetic inputs "underscores the importance of other factors, and by no means provides evidence for the quality of the production system as a whole (Magkos et al, 2006). Culture, on the other hand, helps us to consider all the factors that go into food production. The two have always sustained each other, and to turn food into a trend or an industry is to ultimately lose sight of the values it upholds.

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