

EVALUATION OF THE PERMACULTURE MOVEMENT AND ITS LIMITATIONS FOR  
TRANSITION TO A SUSTAINABLE CULTURE

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## ABSTRACT

In light of the ecological and social consequences of industrial agriculture, several social movements have emerged to demand the transition towards a more sustainable food system. This thesis focuses on permaculture as one such social movement and serves to explore movement dynamics and evaluate its viability as a sustainable alternative to the current industrial mode of production in a United States context. Specifically, the exclusion of contemporary science and political activism in the permaculture movement is analyzed for its hindrance on movement expansion, participation, and application. Content was informed by multiple site visitations and interviews with active permaculturalists in the New England region and the 2014 North American Permaculture Convergence hosted in Clarks Grove Minnesota, as well as a thorough review of related literature in social movement theory, transnational agroecological movements, and permaculture. I conclude that the permaculture movement should engage with scientific institutions and address barriers created by existing political structures in order to be a relevant and viable model for sustainable transition.

## **INTRODUCTION**

Industrial agriculture has been hailed as a technological triumph, revolutionizing the production of food and increasing yields while decreasing costs. This was made possible by the intensive use of chemicals, enormous government subsidies, and the concentration of farmland for monoculture production. Proponents of this new industrial model boasted its efficiencies, touting its ability to produce large quantities of cheap food. The world was promised that industrial agriculture, and the “green revolution” would feed the world. Seventy-five years later, hunger and food security remain as significant challenges, while the perils of this “revolutionary” agriculture have become increasingly apparent and its unsustainability jeopardizing. The analysis of industrial agricultural efficiency has failed to account for the many hidden costs of this approach, including declining rural economies and farmer livelihoods, environmental damage, and public health consequences. These associated costs prevent industrial agriculture from being a sustainable mode of production. Sustainability is described as the balance of care for the environment, economy, and society that is needed to maintain collective well-being and ensure the productive capabilities of future generations.

Another revolution in agriculture is underway that seeks to avoid the environmental and social consequences associated with industrial agriculture. This thesis will explore the approach of agroecology and the associated social movement of permaculture, and evaluate the movement's viability as a sustainable alternative to the current production paradigm in a United States context. Movement dynamics will be explored in terms of their relationship with scientific and political institutions, processes of bureaucratization, and effectiveness in mobilization and expansion.

### **AGROECOLOGY AS SCIENCE, PRACTICE, AND MOVEMENT**

Agroecology is an alternative approach to industrial agriculture that uses ecological theory to

study, design, manage, and evaluate agricultural systems that are productive but also resource conserving (Wezel, 2011). Biophysical, technical, and socioeconomic aspects of farming are no longer studied as separate phenomena, but analyzed as important, interconnecting processes within the entire system. With this holistic view of agriculture and the dualistic goal of production-conservation, agroecology has the potential to avoid the environmental and social consequences associated with industrial agriculture (Holt-Gimenez & Altieri, 2013).

The term agroecology first appeared in the academic literature in the 1930s and was based primarily in the fields of agronomy and biology. Its initial concerns were associated with crop production and protection, but as the field grew in popularity within the academic community its focus expanded to incorporate multiple aspects of agriculture, including social, economic, and cultural issues (Wezel, 2011). This expansion in focus correlates with the rise of several environmental social movements in the 1960s and 70s and the increase in public awareness of the externalities associated with industrial agriculture (Wezel et al, 2011). The expanded definition of agroecology can be applied today in three different, and at times overlapping, uses: a scientific discipline, an agricultural practice, and social movement (Wezel et al, 2011). Though the approach of agroecology evolved with the rise of related social movements, agroecology remains to be viewed predominately as a scientific approach within the United States, and collaboration between science and social movements is often limited (Wezel et al, 2011).

## **BACKGROUND OF PERMACULTURE**

Similar to the discipline of agroecology, the field of permaculture has several interpretations and can be identified as a design system, best practice framework, worldview, and agroecological

social movement (Ferguson and Lovell, 2014). Permaculture began as a holistic design concept co-created by Australian researchers David Holmgren and Bill Mollison in 1978. In their founding texts, permaculture is defined as “an integrated, evolving system of perennial or self-perpetuating plant and animal species useful to man... in essence a complete agricultural ecosystem modeled on existing but similar examples” (Mollison, 1988). Permaculture is a combination of two words, “permanent agriculture” and it was primarily focused on ecosystem design. Similar to the discipline of agroecology, permaculture later expanded its definition to include broader sustainability goals, including human settlements but still retaining a core agricultural focus. By 1988, permaculture became defined as “the conscious design and maintenance of agriculturally productive systems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way” (Ferguson and Lovell, 2014). Permaculture shares with agroecology a regenerative, productive, and whole system approach to agroecosystem design.

Permaculture provides this foundational framework for design and worldview through its three ethics and twelve principles. The three ethics which summarize the ultimate philosophy for permaculture-oriented people and projects are as follows: earth care, people care, and returning the surplus (Mollison, 1988). A permaculturalist should always reflect and evaluate, “Am I regenerating the landscape, are my actions and projects providing support and inclusivity to people, and when I have sufficiently met my needs, do I give my excess to those who have not met theirs?” The twelve principles are: catch and store energy, obtain a yield, apply self regulation and accept feedback, use and value renewable resources and services, produce no waste, design from patterns to details, integrate rather than segregate, use small and slow solutions, use and value diversity, use edges and value the marginal, and creatively use and respond to change (Mollison, 1988). Through these ethics and principles, permaculture teaches an empowering mindset of interconnectedness and responsibility for the self, the community, and the planet. In this way, permaculture encourages individuals to become

involved members in democratically steering their own lives and that of their communities towards ecologically and socially healthy ends via sustainable means. This is a main differentiation between the scientific interpretation of how to achieve agroecology versus permaculture's interpretation. To limit permaculture to an agricultural production strategy is reductionism at its most severe; yet this is all too often what happens in permaculture literature and lectures.

For the purpose of comparison, however, let's indulge in an exercise. Let's take a look at what happens when we give an open field to an industrial agricultural farmer versus a permaculturalist. The industrial farmer wouldn't hesitate to till the soil, chemically fertilize, and begin planting a rotation of genetically modified corn and soy, all of which are dependent upon external inputs such as large machinery, chemical biocides and fertilizers, imported manure, et cetera. On the other hand, the permaculturalist's approach is more akin to working with nature, rather than through actions that go against or drastically alter the surrounding ecosystem such as biocides and tilling. The permaculturalist's initial step would be to simply observe the land for a season or two, noting the way natural forces interact with it. Where does water pool? How does it flow through the land? Where can we maximize winter light? Does wildlife frequent any particular area? These are just some of the many questions a permaculturalist should be asking to ultimately build connections for the purpose of implementing his or her design. Permacultural designs are primarily done with a zoning model of five bordering sections which specify certain activities to certain areas for easier use and management (Zoning model pictured below).



### *PERMACULTURE DESIGN ZONING MODEL*

*(Image used from The Resiliency Institute website)*

Permaculture systems emphasize the use of perennial crops as a sustainable, low maintenance source of food, fiber, fuel, fodder, and pharmaceuticals. In addition to being perennial, permaculture sites are often highly diversified with a wide range of activities taking place. A commercial farm is typically devoted to one function or to one crop, such as dairy production or wheat production, permaculture sites are likely to have a variety of annual and perennial gardens, edible forest gardens, livestock, ponds, and microclimates all interacting in one system.

## **RESEARCH CLAIMS AND THESIS METHODOLOGY**

There is tension between the interpretations of agroecology by the scientific community and how the discipline of agroecology is incorporated into social movements (Wezel, 2011). The first

section of this thesis will explore the disconnect between scientific institutions and the permaculture movement, identify and evaluate how the United States permaculture movement is attempting to bridge this disconnect, and provide further recommendations for engagement. This section proposes that the lack of collaboration between the two ultimately prevents the scaling up of agroecology as a viable alternative to industrial agriculture. The second part of this thesis will advance the discussion of agroecology as a sustainable and achievable alternative by exploring how the interpretations of agroecology, both by the scientific discipline and the permaculture movement, tend to de-emphasize the important and inherent limitations that existing political institutions create for sustainable transition. I conclude that in addition to increased collaboration within the agroecological community, changes within the existing political structures are necessary in order for permaculture to be a sustainable and plausible alternative to industrial agriculture.

Insight to research claims and analysis were informed by a broad range of sources. Throughout the month of August 2014, I visited six permaculture-oriented sites in the New England region and conducted on-site interviews with ten individuals who self-identified as permaculturalists. Interview questions pertained to their involvement with permaculture and what they identified as strengths and weaknesses of the movement. My analysis is also informed by my attendance at the North American Permaculture Convergence in September 2014 hosted in Clarks Grove, Minnesota. Over four-hundred permaculturalists gathered for three days to discuss important issues in the permaculture movement, such as educational standards, and the creation of the Permaculture Institute of North America, and to attend workshops related to different aspects of permaculture. Examples of workshops include: Financial Permaculture, Women in Permaculture, Permaculture and Government Interface, Permaculture Outreach and Promotion, Public Food Forests, Permaculture on Commercial Farms, and Social Patterns: Permaculture Equity and Growing the Movement, to name a few. In addition, to the interviews I conducted and my observations of the permaculture movement, a variety of scholarly works were utilized to inform research and analysis, including works related to social movement

theory, political ecology, and agroecology. While there are very few scholarly articles written on the field of permaculture, one permaculturalist and researcher, Rafter Sass Ferguson, has been very influential in the analysis and data he has provided for the literature. This thesis builds upon his analysis and contributes to the limited body of permaculture literature.

## **PART 1: THE DISCONNECT BETWEEN AGROECOLOGICAL SCIENCE AND SOCIAL MOVEMENT**

The disconnect between agroecology as interpreted by scientists and the permaculture movement can be explained, in part, by their contrasting emphasis on what the primary driver of sustainable transition is. Some scholarly research suggests that the agroecological movement, particularly within the academic field, reveals an increasing influence of a “current agroecology” that is characterized by being scientific, or technocratic (Molina, 2013). “This current considers agroecology almost exclusively as a scientific discipline, producing useful knowledge and technology for sustainable agriculture. It promotes technological solutions rather than institutional or social change solutions for the problems considered in the global alimentary system” (Molina, 2013). This emphasis on science and technology as the primary drivers of agroecological transition contrasts with permaculture's emphasis on individual efforts and voluntary actions as the primary agents of change. In effect, permaculture has largely been an independent grassroots movement, isolated from academic and scientific entities. Though permaculture claims to be a design science, many have labeled permaculture as a pseudoscience (Ferguson, 2014a).

Pseudoscience is defined as “a claim, belief, or practice which is presented as scientific, but does not adhere to a valid, scientific method, lacks supporting evidence or plausibility, cannot be reliably tested, or otherwise lacks scientific status... It is often characterized by the use of vague,

contradictory, exaggerated or unprovable claims, an over-reliance on confirmation rather than rigorous attempts at refutation, a lack of openness to evaluation by other experts, and a general absence of systematic processes to rationally develop theories (Ferguson and Lovell, 2014).”

Considering the trend in agroecology to be increasingly influenced as a scientific and technocratic led transition, it perhaps is not a surprise that permaculture is increasingly being criticized for its lack of original scientific research, data, and analysis as well as the exclusion of contemporary science perspectives in permaculture literature. These critics believe that the permaculture movement's potential to be a viable agroecological transition is discredited by such isolation.

Despite the scientific discipline of agroecology and the permacultural design framework having key shared principles and goals, each of the respective literatures are devoid of the other's perspectives (Ferguson and Lovell, 2014). The majority of permaculture publications are written by non-scientists for a popular audience, with a small number of peer-reviewed texts and an even smaller number of works that include experimental design and statistical analysis (Ferguson and Lovell, 2014). Additional to the dearth of scholarly contributions to the literature, critics claim that the popular literature is filled with overreaching and oversimplified statements by movement adherents in regards to establishing diverse and resilient agroecosystems that are, in their view, not backed by solid, scientific data (Ferguson and Lovell, 2014). The literature, they contend, consistently downplays the risks, challenges, and barriers that might be faced in realistic application (Ferguson and Lovell, 2014).

Permaculture's separation from scientific and academic institutions is reflective of the founders' emphasis on individuals rather than on institutions driving societal change. This is partially explained by the institutional context at the time the permaculture concept originated. It might surprise those unfamiliar with permaculture that the concept originated in a scientific and academic institution. Bill Mollison was a tenured university professor and David Holmgren was his student advisee at the University of Tasmania. Mollison and Holmgren left the university shortly after to devote their energies to creating permaculture design models and spreading the permaculture movement worldwide.

They believed that the diffusion of their movement would be best achieved outside of the conservative settings of academia (Ferguson and Lovell, 2014). This founding attitude of institutions as being too resistant and slow to accept the “radical” proposals of permaculture is still engrained in the permaculture psychology of many movement adherents.

There is a general lack of trust in institutions, including academic ones, for their role in possibly exacerbating a damaging worldview. In addition to this lack of trust, partnerships between educational and corporate institutions are questioned. It is important to remember that conventional agriculture methods remain the predominant focus in university agricultural departments, with sustainability barely a footnote in the majority of curriculums. Therefore, involvement with and accreditation by these institutions has not always been a top priority for the movement. Furthermore, by emphasizing only peer-reviewed, scholarly science as a legitimate form of scientific knowledge, other ways of knowing and traditions that have informed permaculture have, in effect, been devalued. Further separating founding permaculture ideals from contemporary science is the belief that permaculture requires only the recombination of existing knowledge rather than the generation of new knowledge (Ferguson, 2014a). For example, one of Mollison's most widely quoted sayings is “Though the problems of the world are increasingly complex, the solutions remain embarrassingly simple” (Ferguson, 2014a). Therefore, technological innovation and institutionalized science are not viewed by some movement adherents as essential for sustainable agroecological transition, while many within the agroecological movement feel it is imperative. It is important to note, however, that not all permaculturalists regard academic and scientific institutions the same as movement founders. Several leaders within the United States permaculture movement in particular are accepting and responding to this critique in new and significant ways.

Under the direction of several movement “elders” (individuals who are senior teachers, instructed and appointed by founder Bill Mollison), the Permaculture Institute of North America (PINA) has recently been created to help bridge this gap between science and permaculture, as well as

to raise standards and “professionalize” the movement (“Design for PINA”). PINA was first presented to the permaculture community at the North American Permaculture Convergence in September of 2014. Several informational and planning sessions were conducted throughout the three-day convergence. These sessions began with a background of the aforementioned critiques of permaculture being perceived as a pseudoscience, isolated, and not rigorous enough to be taken seriously by outside institutions. Another major discussion included controversies of how permaculture education was being diffused and accessed, specifically through online video series and uncertified teachers, with the elders concluding that these mediums were not credible and were harming the integrity of the movement. The proper response, they believed, would be to create an institute that raises standards for permaculture education and administers certifications of professional achievement.

To understand the context of permaculture education and why there might be differing opinions on how movement knowledge should be obtained, accredited, and diffused, the historical development of permaculture should be explored. As researcher Rafter Sass Ferguson notes:

The growth and dissemination of permaculture is built on two basic patterns: a widely dispersed network of “itinerant teachers” and local/regional organizing based around “bio-regional” cultures and the development of alternative economic and social institutions. The focus on itinerant teachers has distinctively marked permaculture's development with high-profiled professionals-- “permaculture celebrities”--- whose international travel is organized around invitations to teach courses (organized by local conveners) and by employment opportunities as designers and consultants. The focus on traveling teachers likely played a significant role in the rapid expansion of the movement. (Ferguson and Lovell, 2014)

Mollison proposed a community-based system of teaching and learning. Out of this grew various forms of credentialing so that permaculture and its practitioners could gain the respect of traditional social

and educational institutions” (“Design for PINA”).

The first phase of this educational system was the Permaculture Design Course (PDC), a curriculum Bill Mollison assembled from his work with David Holmgren, which was then formalized as a 72-hour course. Those completing the PDC were granted certificates by their teachers on behalf of the International Permaculture Institute (IPI), which was maintained by Mollison. Recipients of certification were encouraged to teach and also to establish local institutes (“Design for PINA”).

Included among these early students are the present leaders of the United States permaculture movement, some of whom now sit on the self-appointed board of directors for the newly created PINA. Their positions of leadership were undoubtedly hard-earned, with several of them practicing permaculture since the early 80s, at a time when permaculture was a significantly lesser known concept. With the recent dramatic expansion of permaculture activity over the past decade, along with critiques and controversies about legitimate and ethical practices, they say there is a need to clarify standards and credentials, and preserve the integrity of the movement. Thus, the creation of PINA, and essentially attempting to institutionalize permaculture in the United States is some of the U.S. movement leaders' response to the critique of isolation and credibility.

In the following section I will address implications of this response and evaluate whether it effectively addresses this critique of permaculture and whether it benefits the movement and its continuation as a whole.

The weak and dispersed organizational structure characterizing the permaculture movement grants such power and decision-making fairly easily to movement elders, despite there being many conflicting views among movement followers. In social movement literature, this process is described as oligarchization, a concentration of power in the hands of a minority of the organization's members (Chapin & Tsouderos, 1956).

This assumed hierarchical structure and consequent power relations are justified by the board of directors clearly on the institute's website as follows: “Age is no guarantee of wisdom in a society that

exploits youth and simultaneously fails them, but in all traditional societies wisdom was acknowledged to be associated with life experience or prolonged observation and interaction. Their voices collected in council are the likeliest guarantee of right action by communities. The power of council can be amplified if its deliberations are applied to upholding ethical standards, resolving practical disputes, and providing a voice for the living and mysterious world in the affairs of humans” (“Design for PINA”). Conclusively, movement leaders propose that due to their many years of involvement and training by founder Bill Mollison, they are entitled to make decisions in regards to the diffusion of permaculture education and subsequent standards of participation in the United States.

The literature on oligarchization within social movement supports this conclusion by referencing the sociological thesis known as the iron law of oligarchy, which describes the inevitable and internal bureaucratization of any social movement “by officials with a vested interest in maintaining their positions and having a stable and non-conflictual relation to the society” (Zald, Mayer, & Ash, 1966). This law of oligarchy goes further in explaining that this elite control shapes the long-term development, of even the most radical organizations in a conservative direction. Movement ideals get “watered down” due to leaders' “non-conflictual” relation to society in order to maintain their status (Zald, Mayer & Ash, 1966). Perhaps it is too early to predict how PINA will shape the development of the movement's ideals, but the parallels between the social movement literature and the process of oligarchization that is beginning to unfold within the permaculture movement are interesting to note. The parallels include why bureaucratization takes place within a movement (elders want to maintain their status) and how this bureaucratization conforms to social norms to maintain the movement's power. This latter point could be argued in the permaculture context by interpreting the leader's shifting of ideological emphasis from “radical” proposals and individual change to a more contemporary science -based and professional movement that, in effect, conforms to outside critique and consequently shapes the permaculture movement in a more conservative direction. This is the very direction founders Bill Mollison and David Holmgren advocated avoiding.

Another important implication of the creation of PINA and its intention to raise standards for permaculture training and education is that the movement may move towards being what sociologists would call an “exclusive” organization. Social movement theory supports the notion that permaculture's continuation and expansion depend in part on mobilization and recruitment of new practitioners (Snow et al, 1986). One important element that determines whether a social movement is able to successfully mobilize is the extent of its membership requirements (Zald, Mayer, & Ash, 1966). The literature describes an “inclusive” organization as one that requires minimum levels of initial commitment with a short indoctrination period or none at all. “The exclusive organization is likely to hold the new recruit in a long novitiate period, to require the recruit to subject himself to organization discipline and orders, and to draw from those having the heaviest initial commitments” (Zald, Mayer, & Ash, 1966).

As previously mentioned, education is the primary vehicle for the diffusion of permaculture and, as such, it would seem logical that in order to further permaculture's influence, the movement should be focused on creating and extending educational opportunities and accessibility to non-members. In fact, this was the rationale behind much of the dissenting opinion: “why create difficult, timely, and costly standards to both receive and teach permaculture education?” (Johnson, 2014). In other words, why create exclusivity? Many permaculturalists in attendance at the North American Permaculture Convergence contended that, with the impending ecological and socioeconomic crisis present in today's world, permaculture skills and ethics need to be diffused widely, and quickly. Furthermore, they suggest that dismantling barriers and creating accessibility should be the most important mission of the movement. For example, mediums of education, such as an introductory permaculture design DVD, should be embraced for their low-cost (\$39 compared to on average \$1200 for an on-site course), eliminating geographic barriers to attending physical courses, and with the ability for one copy to be shared by multiple people. In my own view, if permaculture were to create institutions, it should reinforce these missions. At present, it would seem the Permaculture Institute of

North America (PINA) has more to do with raising standards for new participants and celebrating already entrenched participants.

The critique of there not being enough contemporary science perspective and research is valid to make, but the creation of PINA is not necessarily a beneficial response. Creating standards of professionalism and rigor make it more difficult to participate, be recognized, and ultimately reflects an attitude of exclusivity that hinders the diffusion of permaculture education and the mobilization of new practitioners. Furthermore, the creation of PINA introduces the notion of concentrated power in a formerly dispersed network of practitioners. While this is not inherently wrong, and in fact the social movement literature cites it as inevitable (Zald, Meyer, & Ash 1996), it could, in accordance with social movement theory, imply a more conservative orientation for the movement that departs from founding values and could create factions within the movement.

As Rafter Sass Ferguson has noted, the real consequence of the movement's isolation from contemporary science, is not necessarily being labeled pseudoscience, but rather it really implies that the movement is missing feedback or assessment of how practitioners and the movement in general are impacting a regenerative landscape and economy (Ferguson, 2014a). A systematic assessment across presently uncoordinated sites and permaculture models can only improve future permaculture application. Therefore, if the movement wants to bridge the gap between scientific and academic institutions, I recommend coordinating these efforts through a variety of avenues that are already being explored and executed, and that would benefit from being expanded. These include connecting university scholars with existing permaculture sites to conduct scientific research on site trials and project experiments, and funding permaculturalists with grants to create and research their own projects, similar to USDA Sustainable Agricultural Research and Education grants. And finally, permaculture education could include information about how practitioners can record and analyze their efforts, or connect them with, for example, a North American Institute that could collect and share the data with students, teachers, and practitioners in a concentrated database.

To conclude, I suggest that an increased effort of collaboration is needed between the two applications of agroecology in an academic and scientific context as well as the agroecological social movement of permaculture. Agroecology ultimately transformed its focus after the rise of related social movements in the 1960s and 70s, and should resume this acceptance and collaboration with related, popular social movements. This transformation was a positive step within the discipline to advance its holistic framework to include other important aspects of sustainability, such as social, economic, and environmental concerns that had previously been neglected. In this way, social movements can help keep academia grounded on important issues that might otherwise be displaced or unnoticed within academic and scientific institutions. Conversely, scientific institutions can provide the permaculture movement much needed measures of assessment and analysis that would help the movement collect and diffuse their presently uncoordinated models and associated knowledge to a wider audience.

## **PART TWO: EVASION OF CURRENT POLITICAL STRUCTURES AND ITS IMPLICATIONS FOR ACHIEVING LARGE SCALE SUSTAINABILITY**

The above portions of this thesis have argued that permaculture's isolation from scientific institutions hinders its capacity for assessment, knowledge, and replication of existing models. Therefore, I argue for an increased collaboration between the two. In the following sections, I will identify how permaculture's elusion of political structures also hinders its ability to achieve sustainability through the barriers these structures create in movement participation and production application.

Founding ideology contends that sustainable culture is to be achieved by positive actions, personal responsibility, and simple solutions. This proposed strategy for transition is empowering for participants and is likely a main factor that makes permaculture relevant and appealing to its many followers (Ferguson and Lovell, 2014). However, portraying agroecology and sustainable transition as

something that individuals can achieve at home, whether it is utilizing contemporary science or permaculture techniques, is a double-edged sword (Ferguson, 2014b). “While prioritizing the perspectives and capacities of land users is important, it may also run the risk of depoliticizing aspects of agroecological transition that are fundamentally political and trivializing the complexity of socioecological processes and struggles” (Ferguson, 2014b). One scholar has noted this deficit in the literature on agroecology and permaculture, and has demanded the need for socioeconomic structural reforms as a precondition for achieving truly sustainable agriculture (Molina, 2013).

In its current state, the agroecological movement's political ambition is reflected in a few political proposals that go beyond the local sphere (Molina, 2013). It is not surprising then that agroecology in practice continues to be experienced on a small scale and apart from governmental institutions. These experiences could be viewed as uncoordinated “islands of success in a sea of privatization, poverty, and environmental degradation” as scholar Molina suggests (Molina, 2013). Or they could be viewed as intentional trials that some members of the movement argue is a necessary starting ground, despite the lack of coordination. Creating working, exemplary models in communities around the country can be a powerful outlet for individuals or small groups who are interested in transition yet do not have or want a great deal of political agency. Sylvia Davatz, a Vermont local who grows, saves, and shares seeds (through her regional catalog) and whom I met on my travels, perhaps summarizes this stance best: “What I am doing is making a broken system irrelevant” (Davatz). She sees in politics or political protest, a kind of futility, which is an attitude commonly held among the permaculture following (Alkon, Hope, & Mares, 2012). Whether or not, movement members agree with this attitude and approach of individual models, I argue there are resulting implications for the efficiency and the stability of permaculture experiences which, at present, hardly reach the required size and breadth of land to be considered a viable alternative.

Some scholars note that agroecosystems are much more than physical and biological processes,

they also reflect the social, economic, and political context within which they were designed (Holt-Gimenez & Shattuck, 2011). These scholars contend that agroecosystems must be sustained in this given context. Therefore, if politics affects the sustainability of agroecosystems, then agroecological movements should have a political dimension (Molina, 2013). This dimension within the movement could advocate for political proposals or institutions that make agrarian sustainability possible (Molina, 2013). An example of an agroecological movement that has a strong, political presence is La Via Campesina. One of the main political proposals that they view as essential to the sustainability of agroecology is food sovereignty. Food sovereignty asserts that the people who produce, distribute, and consume food should have a say in the mechanisms and policies of food production and distribution, rather than the corporations and market institutions that dominate the global food system (Holt-Gimenez & Altieri, 2013).

Permaculture ideology espouses that the solutions for sustainability are simple. Perhaps it is not surprising then that permaculture also offers simple explanations for the problem. Bill Mollison's explanation for the problem, expressed in The Designer's Manual, can be summarized as “greed, stupidity, and a false sense of superiority to nature” (Ferguson, 2014b). While these attributes may all be true, it does not explain what factors present in our current modes of production and consumption reward and encourage and exasperate behaviors of greed, stupidity, and superiority (Ferguson, 2014b). While there is mention of the need for alternative institutions in the final chapter in The Designer's Manual, it focuses on a new model for the United Nations, and offers little in practical strategies to challenge opposing political institutions at a local, regional, or national levels.

The subsequent decades of literature offer nothing new to the conversation, except for maybe repetitions of the phrase “invisible structures.” Invisible structures can be defined as the intangible elements necessary for the healthy functioning of a system (Mollison, 1988). These include how we exchange goods and services, how we transmit knowledge and information, and how we make

decisions in groups, to name a few examples. But their fuzzy, intangible nature has made it challenging to apply them to permaculture designs in any systematic way. Perhaps, instead of calling these structures invisible, and consequently having these structures largely invisible from permaculture literature and designs, the discussion of these structures should be geared to connecting how these underlying structures are in fact very visible in the current economic system, and how these structures affect permaculture practitioners, communities, and the world in tangible ways. Specifically, permaculture should focus on how these structures inhibit participation and widespread application of permaculture.

To ignore these structures in permaculture education and application is to ignore that permaculture-oriented projects and sites rely on and compete within the same systems they oppose and, furthermore, are competing with degenerative enterprises and institutions that are rewarded for the destruction of these same systems (Ferguson, 2014b). Efficiency has the advantage and thus has become production priority. Not quality. Not justice. Not earth care. Not people care. Permaculture production that values fair wages, just labor conditions, regenerative environmental design, and organic production (to name a few qualities) unfortunately comes with a higher cost, a cost that is faced by people with less of an economic buffer, and the very communities that permaculture seeks to regenerate (Ferguson, 2014b). To put it simply, most people can't afford to support the regenerative economy, or if they can, are structurally encouraged to support the degenerative one. Thus, even if permaculture designs were a perfected model for sustainability, I argue that the widespread adoption of the design would still be limited by operating in a larger context that systemically perpetuates inequality. What is necessary, then, are new, or reformed, institutions that can provide resources to support sustainable decision-making and regenerative economies (Edelman, 2001). This idea is a fundamental split in opinion among permaculturalists with regards to the role of institutions and governments. The emphasis on voluntary action by individuals and small groups within the food movement, seems to

accept and even embrace this individual action as a new mode of governance (Guthman, 2008). Many individuals within food movements have, to some extent, given up on the governance of the state as a provider of services, regulator of externalities, or provider of subsidies (Guthman, 2008). These responsibilities, then, are perceived as actions that must be performed and provided by individuals or small groups (Guthman, 2008). In other words, these individuals believe that the changes they seek in the current food system can best be accomplished outside of the state (Guthman, 2008). Guthman finds fault with this approach and points to what changes can not yet be accomplished outside of the state, such as the formation of product pricing, inputs used, subsidies and incentives, and trade agreements, all which dictate on a large scale how our agricultural landscapes are managed and whether they are economically viable. These are the same decisions that largely dictate permaculture, or agroecology as a whole, as economically nonviable (Molina, 2013). All such decisions are dependent on regulatory spheres that are often far removed from local communities and are responsibilities still controlled by governmental institutions (Rosset & Martinez-Torres, 2012). Other responsibilities still dependent on state institutions that I believe would help extend access to sustainability would be the widespread alleviation of socioeconomic inequalities, such as affordable access to land, education, healthcare, and fair wages.

Evidence of permaculture's inability to combat these structural imbalances goes beyond the reality that application remains to be seen on a local and isolated scale. Membership also reveals an important social imbalance in terms of racial/ethnic diversity. This is true of many environmental organizations, not just for permaculture, but it is noted because it is an imbalance that is not consistent with the ethics and principles of the movement in terms of the people care ethic and the diversity principle. A survey conducted by scholar Rafter Sass Ferguson among permaculture followers in the United States reveals that of the 448 participants surveyed, only 24 identified as other than White/Caucasian: 5 Native American, 8 Hispanic, 8 Black/African American, and 3 Asian or Pacific

Islander (Ferguson, 2014b). As Ferguson notes, beyond the numbers it is crucial to recognize that people of color involved in permaculture are still less likely, compared to White people, to identify themselves as members of the permaculture movement. Analysis of the survey goes further to describe imbalances in gender participation (Ferguson, 2014b). While women have a relatively equal participation in permaculture, their roles tend to disproportionately be low-status support roles, such as students or community members, compared to men who are more likely to identify with high-status leadership roles, such as teachers, or professional ecosystem designers (Olsen-Ramanujan, 2013). Ferguson and Olsen-Ramanujan, along with other scholars, conclude that the race and gender imbalances characterizing the present permaculture movement result in a loss of critical contribution from community groups whose participation and leadership permaculture needs to thrive and expand (Olsen-Ramanujan, 2013; Ferguson, 2014b).

These trends in the permaculture movement tend to reflect imbalances in society at large. Several permaculturalists agree that it is because of institutional structures that go unchallenged by the movement. Pandora Thomas, a rising permaculture leader in the San Francisco Bay Area says, “There hasn’t been enough work done around permaculture principles translating them for the people care ethic, so now there’s this misconception that permaculture is about farming and gardening, which it isn’t—it’s mostly about relationships. It’s about looking at systemic problems and finding relationship-based whole system solutions and one of most vital systemic issues, along with the status of women, is cultural and racial inequity” (Olsen-Ramanujan, 2013).

I believe that the tendency in permaculture to depoliticize systemic inequality and focus on production techniques makes the movement somewhat irrelevant to populations with real socioeconomic struggles, and therefore forfeits their contribution. Not only does the movement do little to actively address systemic relationships, it at times reinforces them. For example, the cost of access to a permaculture education and related books, essentially the movement's main method of diffusion,

creates real barriers to entry for low-income groups. It is typical for many permaculture-related courses to cost within a range of \$1000-\$2500 for three-to-four day workshops. In fact, most introductory PDC classes (again, 72 hours) are anywhere from \$800-\$2000. What many consider the seminal work, The Designers Handbook, by Bill Mollison costs \$130. I believe these costs create barriers and profit from the capitalization of permaculture knowledge. In my opinion, the aforementioned institutionalization of permaculture education, via the newly created Permaculture Institute of North America, is likely to compound inaccessibility by making it more costly and geographically limited to receive and teach permaculture ethics and techniques.

The challenge for the permaculture movement at this stage concerns how to develop production techniques and diffuse them in an inclusive, accessible way while simultaneously confronting political structures or at least addressing barriers to participation and application that these structures create. These challenges and others raised in this thesis are important opportunities for further research. There is much to learn from social movement theory, grassroots innovation, and other transnational agrarian movements that could inform the permaculture movement in these areas that are currently lacking or limited. My research was to serve as a primary evaluation of the movement in its current form and present the limitations that I believe need to be further explored in order to be a viable alternative.

In conclusion, scientific innovation, emphasizing individuals as agents of social change, and supporting political structures, can all be important catalysts for the widespread implementation of sustainable, agroecological models. I propose that permaculture should become a movement that emphasizes all three methods of change as necessary or important in the expansion, diffusion, and widespread application of its sustainability model. This can be done by retaining focus on individual action but also by collaborating with the scientific community specifically in developing measures of assessment that can create standards, provide important data, and refine permaculture techniques to a functioning model that can be easily replicated. In effect, making widespread application possible.

Additionally, confronting barriers that existing political structures create for the permaculture movement such as, production subsidies and socioeconomic inequalities that create challenges to accessing land, food, and education, are important actions for transitioning to a sustainable culture and making the application of the permaculture model more accessible.

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## Appendix

My involvement and knowledge of the permaculture movement began prior to the research of this thesis. I completed my permaculture design course under the instruction of Weston Lombard at Solid Ground Farms in Athens, Ohio. My certificate was completed in May of 2014, and with that certification began the intense pursuit of additional experience within the field. Many popular books on permaculture have been read on my own time and based on my own interest. After a significant amount of coursework and reading, I decided I wanted to see applications of permaculture on a farm and community level and assess the limitations or challenges in applying permaculture ethics and principles in reality. I traveled through New England in August 2014 visiting permaculture-oriented sites and spoke with five permaculturalists, asking them questions related to the development of their site, their own views on strengths and weaknesses of the permaculture movement, and challenges they faced or still face in permaculture application. I visited D-Acres Permaculture Education Center in Dorchester, New Hampshire on August 12th and interviewed director Josh Trought and farm manager Brett Ingle. Sylvia Davatz, a well known seed-saver, was interviewed at her home in Hartford, VT on August 19th. The final visit was with a permaculture herbalist named Susannah Raeven in Berne, NY. She along with one of her interns were interviewed on August 20th. At the conclusion of the trip, I attended the North American Permaculture Convergence in Clarks Grove, Minnesota in September 2014. This three-day convergence brought together approximately four-hundred permaculturalists from across the continent for a variety of presentations and working groups that addressed current themes within the permaculture movement. The dialogue that took place in these working groups and my own observations of the event inform much of the analysis in this thesis. This research was done out of my own personal interest and involvement with the permaculture movement and content will be used for my own application of permaculture design at Fern Hollow Farms in Somerset, Ohio and related projects.