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# Toward 21st Century Permaculture: Critical Questions and Early Answers

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## Converging crises, divergent questions

We face a host of converging, intersecting crises: climate change, peak energy, an increasingly unstable global economy, habitat loss and the mass extinction event it entails, the active erosion of power invested in democratic processes (however flawed) and concentration in the capitalist owning class, the ongoing release of toxic and long-lived pollutants, spiraling inequality within and between nations, rampant racism and ethnocentrism - also within and between nations, the proliferation of small arms as well as weapons of mass destruction... the list goes on and on.

We are confident that permaculture holds solutions to a number of these crises - or at least *some* of permaculture holds solutions to *parts* of each of these crises. But how? Each crisis is in itself fiendishly complex. That they all interlocking and mutually-reinforcing makes it difficult to even formulate the question in a way that makes sense and is answerable.

We know our answers. Some of us would say that the simplicity of permaculture's prescriptions are enough *because* they are simple - they cut through the overwhelming complexity of converging crises. Just use permaculture to design a big garden or a small farm. Get your neighbors to do the same, if they aren't already, and start sharing resources. Once you know

what you're doing, teach or start designing for others. Those are our answers.

But, in the face of these converging crises, do we actually know what our questions are? As long as the answers remain the same, frozen in time by dogmatic faith in our fallible pioneers, we don't need to. New questions, the kind that I believe are demanded by the nature of the crises we face, will point us in different directions and into unfamiliar territory. I believe that's where we need to be heading - but we need to know what our next questions are before we can begin answering them.

I've been involved with permaculture since I took my PDC in 2003, and for the last four years I've been conducting different kinds of research about permaculture in the context of a PhD program at University of Illinois. Permaculture is vast, it contains multitudes, and no single view of it is nearly adequate for understanding. So my dissertation has taken the form of three projects, which each embody a different view of permaculture - as a parallel to the scientific discipline of agroecology, as a movement, and as a farming system. Through each of these lenses on permaculture I will briefly discuss the strengths and vulnerabilities they highlight and the critical questions they pose. I will go one step further and suggest what I'm calling 'early answers,' that are necessarily partial and preliminary, a mix of substantive response and pointing to further questions. Analysis of the data from the

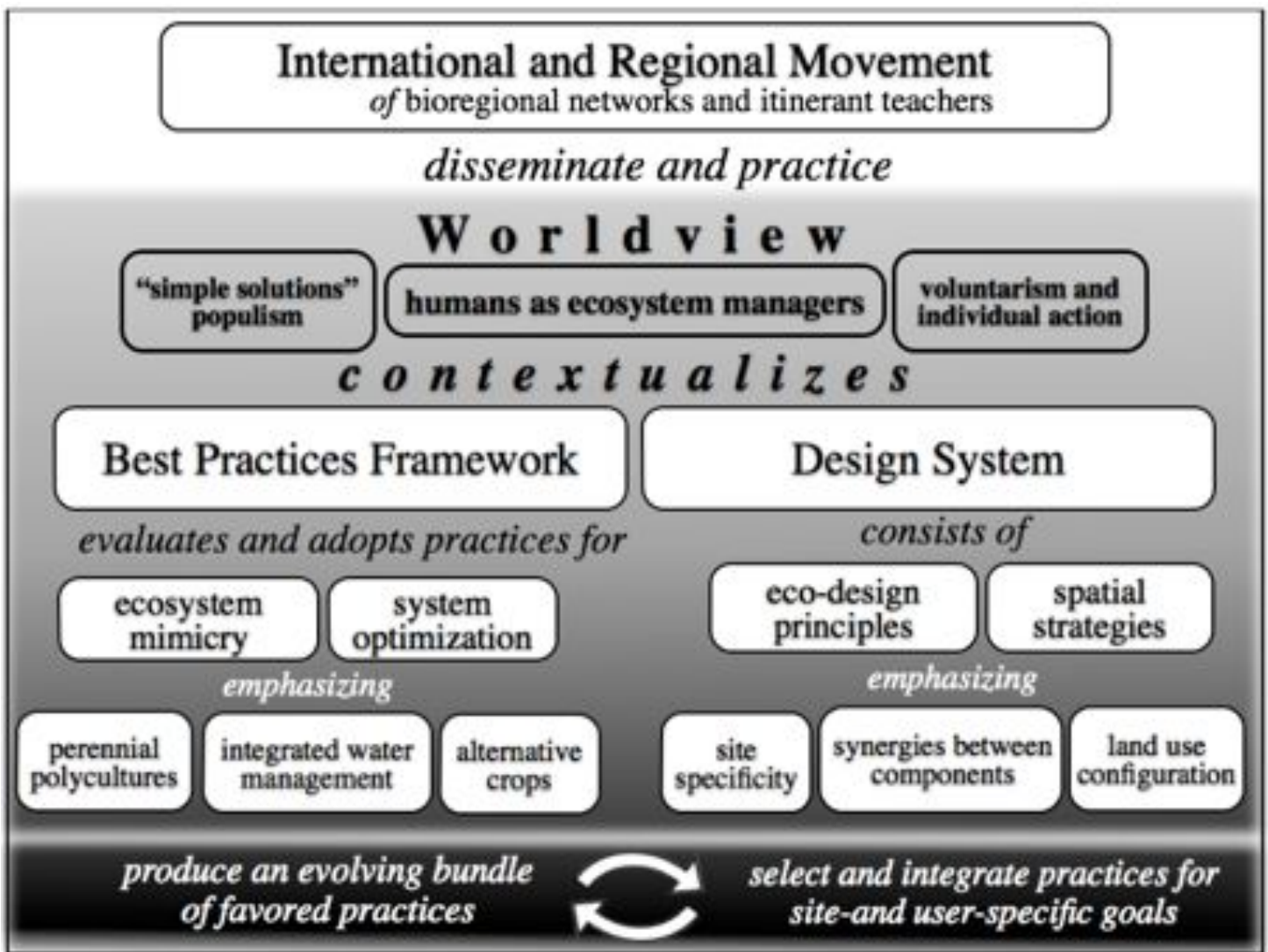
latter two projects is still ongoing, so discussion of their results is limited to certain areas.

### The View Through Agroecology

I conducted and published a systematic review of the permaculture literature in 2012 and 2013 (Ferguson and Lovell 2014), from the perspective of it's closest ally in the sciences: agroecology. Focusing on agroecology means that there are many aspects of permaculture that I don't address - architecture, forest management, urban planning, etc. My goals were to identify, through the lens of agroecology, the key distinctive characteristics of permaculture: What is be-

ing proposed? How does it correspond with the scientific, peer-reviewed agroecology literature? Where it doesn't correspond, when is it a case of permaculture shining a light on a topic that agroecologists should be paying more attention to? And when is it a case of problems in the permaculture literature?

Because agroecology is very transdisciplinary (Méndez et al. 2012), I was able to take a multi-layered look at permaculture. "Permaculture for Agroecology: Design, Practice, Movement, and Worldview" is freely available for download on my website, and through the journal *Agronomy for Sus-*



This concept map shows the distinctive characteristics of permaculture, considered in a multi-layered view as design, practice, movement, and worldview. It is adapted from Ferguson and Lovell 2014.

tainable Development, so I'll only address key findings here.

## Strengths

The good news is that the framework we promote, in broad strokes, is extensively supported by contemporary science. The principles and themes of our work largely complement, and in many cases provide a useful extension of, those in the agroecology literature. Our focus on site specificity in design, and on principles like diversity and multifunctionality, are widely echoed across a broad swath of agroecological research and theory. There is very rich empirical support for the importance of perennials, polyculture, integrated water management, and land-use diversification. And permaculture yet offers something distinctive and critical to that body of research, as an integrating framework that makes explicit how all of these elements are meant to work together. Permaculture emphasizes the transformative potential of these elements in a way that's provocative and useful.

And in some cases, permaculture does indeed shine a light on a neglected topic. The *design of agroecosystems* is a subject that receives very little attention in agroecology (in English-language publications, anyway). Our rich discussion of the integration of multiple components in a specific site does not have any parallel in the scientific literature. For instance, we present a set of tools for thinking strategically about *configuration*, or arrangement in space, that is provocative and unique. The hypothesis behind Relative Location, Zones and Sectors, and related principles, is that it's not just how we decide on land uses, but how we arrange them in the landscape, that drives all kinds of functions and whole-farm outcomes. This is a reasonable and testable hypothesis that is simply not addressed in any systematic way in the agroecological literature.

## Vulnerabilities

There is ample material for a rich dialog between permaculture and agroecology. But that doesn't mean

it will always be easy. For permaculture, one of benefits for us is in being called to account. Our literature shows that we have a weakness for extrapolating from ecological principles in a way that oversimplify the processes at work, and for making claims and prescriptions based on those principles that wildly overreach what we really know how to do. Much of this involves what is, at best, a confusion around the relationship between different kinds of productivity: namely, net primary production (NPP - basically, total photosynthesis minus what's used up in daily metabolism) on one hand, and production of harvestable yields on the other. . This shows up in how we discuss forest gardens, polycultures, perennials, the edge principle, and diversity (and possibly elsewhere). I discuss this in somewhat more depth in the paper. In short, higher net primary production will **not** necessarily produce more human-edible stuff. Even when higher NPP does translate to increased production of human-edible stuff, factors like increased harvest labor can easily swamp production gains. At best, it's confusion - at worst, it's a smoke-and-mirrors sales pitch.

The permaculture literature also underplays the complexity and risk involved in developing and managing diversified farming systems (DFS). Starting or transitioning to DFS is an incredibly complex task - especially in the industrialized world, where farmers must compete directly with the cheapest commodities in the world (Kremen et al. 2012; Bowman and Zilberman 2013). Very little of the wealth of farm planning and decision-support materials out there are appropriate for diversified farms, and even less so for those that incorporate perennials. So far we have offered little to fill that gap. Even though they are ultimately safe for society as a whole, the kinds of farm systems we advocate for are currently risky enterprises for new and transitioning farmers. Our literature mostly offers lot's of principled encouragement and does little to acknowledge the complexity of the undertaking.

## Critical Questions and Early Answers

### *Is the oversimplification necessary for the growth of permaculture?*

I suspect that this fearful question lies at the heart of some permaculturists' insistence on the dogmatic simplicity of principles and techniques. I do think it's possible that the simplest narrative possible will attract more converts faster - there is plenty of evidence for that from the world around us! (Fox News, anyone?) But as I discuss in my other article in this issue, "Toward 21st Century Permaculture: Peoples' Science or Pseudoscience?", I think we can be very effective with a balanced narrative, that invokes both the power we each hold to engage and transform our situation, and the burning questions that we need to answer in order to really succeed.

### *How do we improve permaculture's relationship with science and evidence?*

The Peoples' Science article addresses this question in depth.

## The View through the Movement

In 2012 I conducted a web survey, open to anyone who identifies with permaculture in any way. Despite being rather long, with no financial reward (as is often offered with online surveys), being available only on the web, and only English, the survey received a tremendous response. After culling responses with low levels of completion and/or no geographic information, I was left with 761 responses from 46 countries. This represents an extraordinary body of data, and I'm very grateful to everyone who contributed their time and perspective. The results discussed here represent a small portion of the first pass at analysis of the results.

It's important to note that because the survey is not a random sample from a known population, it can't be used to make the usual kind of statistical inferences about permaculture in general. The survey was what's called a 'convenience sample' - in other words, the

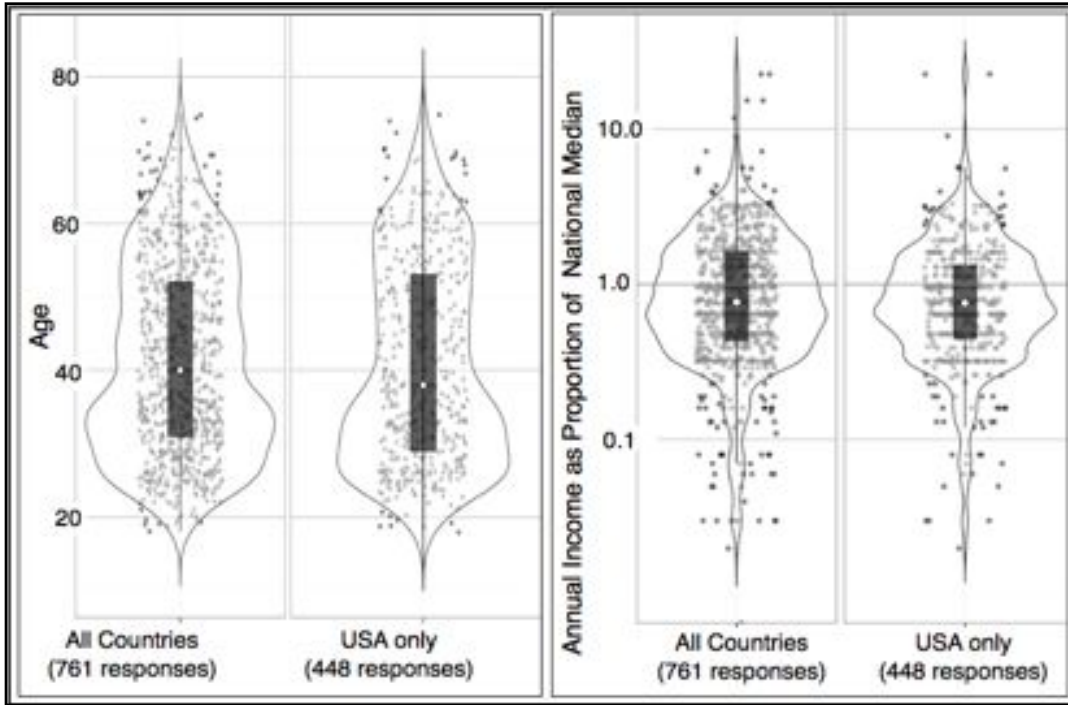
respondents are whoever I could get to respond! That being said, 761 responses is a *lot* of data, with a lot of power to inform our assessment of where the movement is at. We simply need to keep in mind all the ways in which the survey sample may be skewed relative to the whole of permaculture - and use the data to identify critical questions rather than exact answers.

## Strengths

As many have noted, diversity is a source of strength and resilience in social systems as much as in ecological systems. And in many ways, the survey responses illustrate a high level of diversity. Survey respondents were very diverse in terms of age, and had a higher proportion of women than the general population. Permaculture is also fairly diverse in terms of several indicators of socio-economic status: income (as a proportion of the national median income), home ownership, and level of education. This is a marker of success that we can be proud of and should build on.

## Vulnerabilities

Permaculture is not diverse across all factors, however. We appear to be simply replicating some of the patterns that exist in society at large. This is not especially surprising, but it is very serious. Permaculture has a very serious problem with racial/ethnic diversity - we are overwhelmingly White. For example, of 448 responses in the US, only 24 identified as other than White/Caucasian: 5 Native American, 8 Hispanic, 8 Black/African American, and 3 Asian or Pacific Islander. To put that in perspective, if the US survey respondents were proportional to the national demographic makeup, there would be 324 White/Caucasian, 4 Native American, 73 Hispanic, 56 Black/African American, and 22 Asian or Pacific Islander respondents. And it goes beyond the bare numbers: people of color who are involved in permaculture are still less likely, compared to White people, to identify themselves as members of the permaculture community.



These plots show the distribution of responses across the variables Age and Income. Each grey dot represents a single response. The grey box is a standard box plot showing quantiles of the data, with the central white dot showing the median value. The curving lines are density plots that show the frequency of response across the range of values.

in order to thrive and expand.

### Critical Questions and Early Answers

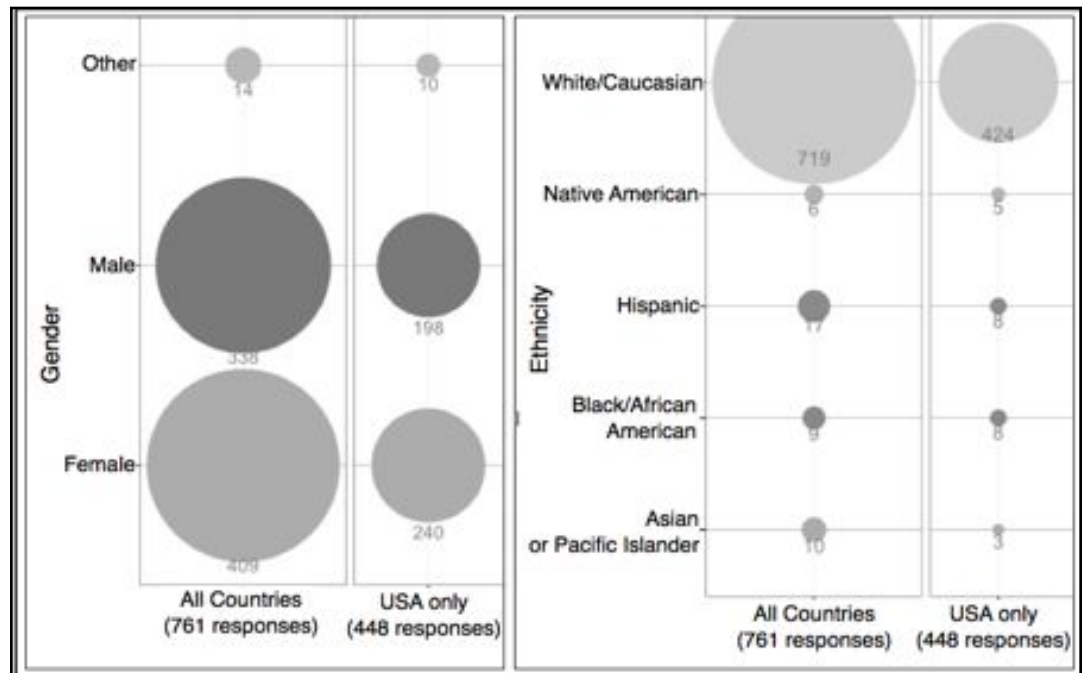
*How can we stop replicating within our movement the sexism that exists in society, and foster a level of women’s leadership that is proportional to their participation?*

Here I’ll refer you to an excellent article from Permaculture Activist August 2013, “A Pattern Language for Women in Permaculture” by my friend and colleague Karryn Olson-Ramanujan.

You can order the back issue

It’s also the case that, while women are well represented as participants, the genders do not describe their participation in the same way. The survey showed that women are significantly more likely than men to identify with relatively low-status support roles (student, community member), while men are more likely than women to identify with relatively high-status leadership roles (teacher, professional, designer). Through race and gender, we are losing out on critical contributions from groups whose leadership permaculture needs badly

or find the article on her website, <http://seedsustainabilityconsulting.com>.



These balloon plots show proportion (area of circle) and number (label) of responses among the categories of the Gender and Ethnicity variables.



*Knowing that being a white-dominated movement right now creates barriers for the participation of people of color, how do we get through this bottleneck?*

First, we need to face the seriousness of this issue head-on. The idea that we could accomplish what we need to accomplish while maintaining our severely unbalanced ethnic/racial makeup is be willful madness. This problem is even more complex than gender, as it goes beyond the roles that people identify with, to fundamental presence or absence in the movement. It requires it's own ongoing discussion (even it's own theme issue of this journal). I comment briefly here, at the risk of doing damage to the complexity of the problem. Second, in order to succeed in navigating this complex landscape, the White majority in permaculture need to educate ourselves about racism. The standard education on these issues that most of us have received is no more adequate to the task than a high school agronomy class equips you to create regenerative agriculture. Some accessible starting points are listed in the Resources and References section (Bracey 2013; Perry 2013; Wise and Harris-Perry 2013; Drayton and McCarthur 2014).

Third, we need to shift our thinking about diversity from a *recruitment* paradigm to a *relevance* paradigm. Under a recruitment paradigm, we try and get people of color to enter into permaculture spaces through a variety of strategies (some great, some flawed). We then end up wondering "*but why don't they come?*" In a *relevance* paradigm, we stop worrying about what 'they' are doing or not doing, and put our focus where we actually have leverage: ourselves. What are *we* doing to be relevant and welcoming to communities of color? That process must begin with, and be carried by, a practice of *listening*. These are issues I try to address in liberation ecology workshops. They are also addressed powerfully in a booklet that should be required reading for permacultur-

ists, called *Organizing Cools the Planet* (to which I made a very minor contribution; Russell and Moore 2011). Since this is neither a new problem nor one that is unique to permaculture, there is a wealth of resources we can draw on - as long as we accept how serious an issue it is.

## **The View through the Farm**

In 2013-2014, I visited 48 permaculture sites across the US (and drove 18,000 miles in the process). These were all sites that identified themselves as a farm, and all specifically identified permaculture. In selecting sites, I didn't ask about practice - only asked about whether and how much practice was influenced by permaculture. I didn't assume anything about practice at the outset because my interest was to see what happens when the abstract and universal principles of permaculture touch down in a specific site, with it's own complex social and environmental dynamics, where someone is trying to make their livelihood. At each farm I gathered several types of data: (a) participatory assessment of the distribution of labor, income, and expenses, across enterprises and across four seasons; (b) quality of life and attitudes; (c) participatory mapping of land use; and (d) geotagged photo-documentation during a farm tour. While diverse in many ways, and spanning a broad range, the farms were in general small (most under 10 acres), young (median age of 5 years), with relatively new farmers (median experience 7 years). I'm deeply grateful to all the farmers who generously took time with me - and often hosted me as well. I'm also deeply grateful to the nearly 200 supporters who collectively donated \$10,420 to make this field research possible.

## **Strengths**

Permaculture farmers in the US, like anyone else attempting to manage a diversified farm in this context, face serious political-economic barriers. We are, after all, half a century in an ongoing policy war *against* diversified farming systems - all in favor of capital-



*This map shows the routes followed on my field research, and the rough locations of the farms I visited.*

intensive commodity production and long-distance trade. The permaculture farms I visited displayed a remarkable range of strategies in order to create niches and buffers to shelter them from hostile policy and market forces, so that they can do the kind of production that they are called to do.

Permaculture farms exist across a broad range of scale, and are very diverse in terms of land use and enterprise configuration, farm structure, market strategy, and social context. Nevertheless some patterns emerge from observation across many sites. Many farms are organized around goals other than straightforward economic production, prioritizing other strategies making change. None of the patterns discussed here are mutually exclusive, and virtually all the farms exhibited several of them to varying degrees.

Some farms prioritize **informal direct exchange and consumption**, using subsistence production, barter, and direct exchange to facilitate reduce the importance of money in human relations rather than optimize income. Other farms focus their energies on regenerating **permanent production landscapes**, re-

storing clearcut hillsides and denuded overgrazed rangeland using production practices and helping increase the long-term productive capacity of the regional landscape. For some farms, **education and community building** are central, and the focus is on fostering opportunities to share knowledge and develop relationships providing resources for community meetings, running workshops, hosting farmer incubation programs, and

other programs. These programs can also bring in money to invest in developing production systems.

And some permaculture farms, of course, focus on **financially robust production**, demonstrating working models of diversified farming systems that incorporate organic market gardening, mixed orchards, rotational grazing systems, and other land uses, in a site-specific patchwork. To achieve financially robust production demands extremely strategic allocation of resources, especially labor. This pattern is also the least common among all the farms I visited. While I have not run the numbers yet, it definitely seems to be associated with older farms and more experienced farmers.

### **Vulnerabilities**

While each of the above strategies is crucial for transitioning our food system, the critical gap right now is in the pattern of **financially robust production**. The weakness is not in the farms, though, but in our expectations.

Early in my field research, I noticed I was feeling slightly disillusioned with the lack of more mature,

scaled-up, production-oriented systems. On reflection, I realized that I had been doing some magical thinking about the role and capacity of permaculture in the political-economic context of the US. I realized that I had been expecting through the power of whole systems thinking, *individual farms* would somehow be able to sail upstream against the overwhelming current of market and policy forces. I was applying systems thinking inside the farm boundaries, and being naive about the systems in which farms are nested! This is the analogy the I came up with as an antidote to that naiveté:

***Trying to develop a diversified farming system in the US is like trying to write a sonnet while someone is spraying you in the face with a firehose.***

Somehow, some farmers do manage to do it. We must learn for them. But at the same time, until we change the *context* that farmers are operating in, financial success in diversified farming will always be the exception.

### **Critical Questions and Early Answers**

*How can we change the context of permaculture farmers, and diversified farms more generally, in order close the gap in financially robust production, and support the other patterns and strategies?*

I think of these issues along a spectrum from the individual farm to the global economy. I'll continue with my sonnet/firehose analogy...

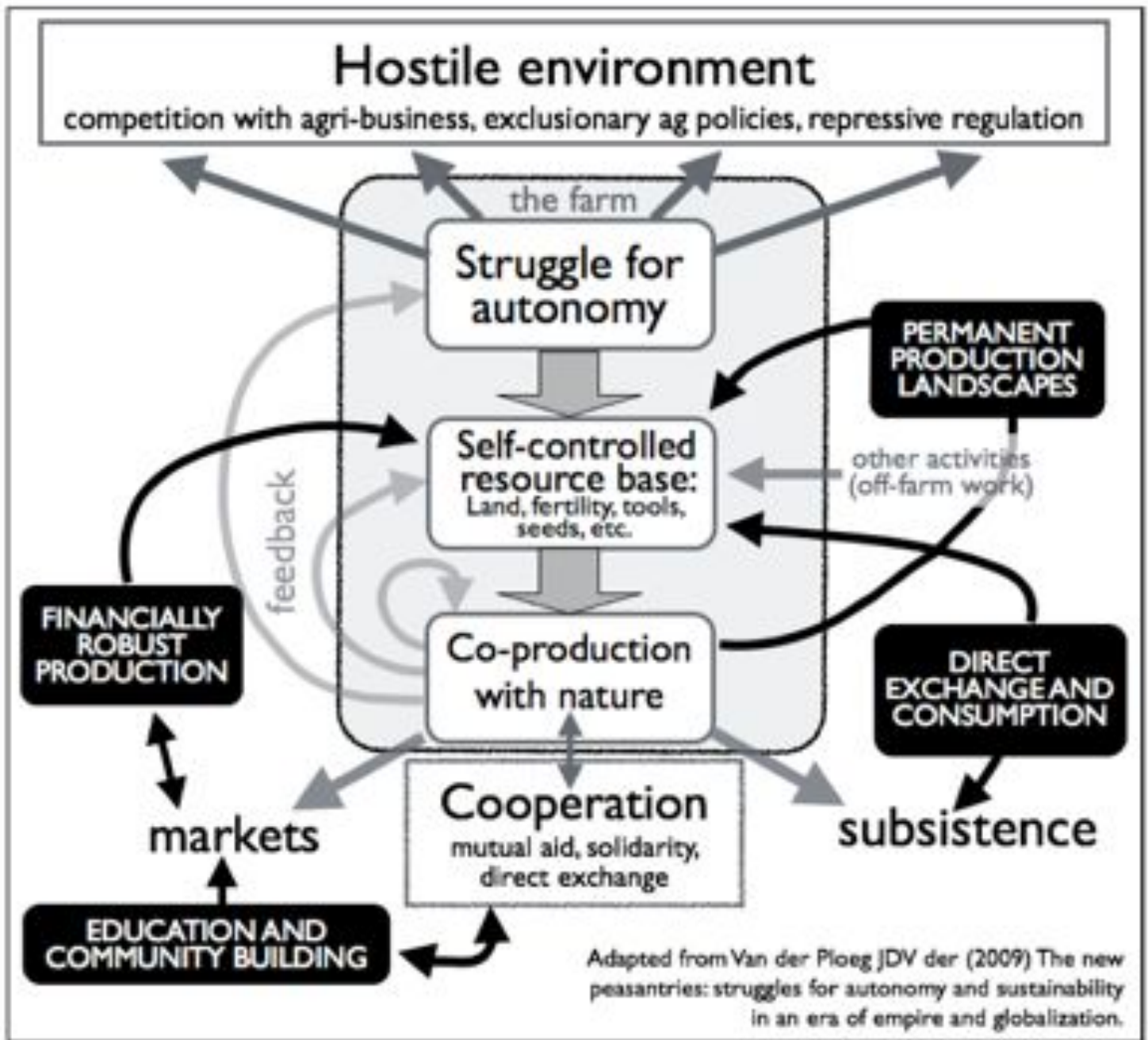
*On the Farm: Practicing the Poetry.* There is no getting around it: diversified farming is incredibly complex. Even under ideal conditions, it takes time and experience - and room to make mistakes! - for anyone to learn how to do it. Permaculture farmers might have a great design toolbox, but they don't have much more support in their learning process than any other diversified farmer, i.e. very little indeed. Agroecology

has shown us that the best people to teach farmers are *other farmers*. We can support **farmer-to-farmer learning** through a variety of existing models (see People's Science article), and will definitely need to innovate new models adapted to our unique context(s). Fundamentally, we need to evolve past the notion that farmer's paying to attend the workshops of visiting experts is adequate to our task, and begin putting resources toward supporting farmer-to-farmer dialogue, skill-sharing, and collaboration.

This is not to say that experts and workshops have no role to play. One of the ways they can contribute is through the development of business planning tools that are relevant to permaculture farms. There is a wealth of business planning tools available for farmers in the US, and almost none of them are applicable to diversified systems, or for perennial species with long development times. When you consider a farm that is both heavily diversified *and* incorporates lot's of perennials, the support for planning drops to zero. Farmers are left to plan on a wing and a prayer. This is like trying to write a sonnet without being able to count syllables, and just hoping that you'll nail it on the first draft...

*In the Market: Diverting the Stream.* The business end of the firehose is that farms in the US have to compete directly with subsidized, mechanized, fossil fueled, farmworker exploiting, polluting, large-scale commodity production. Because of the nature of our food system, people in the US spend far less on food (as a proportion of our income) than anyone else in the world. We therefore have incredibly unrealistic ideas about what food should cost. The harsh reality is that we need to simultaneously support diversified farmers in figuring out how to supply food more cheaply, while at the same time figuring how to help people **pay more for food**. For the former, there are numerous old and new models emerging from the local food movement, many of which revolve around direct farm-to-consumer relationships. On the farm





This figure takes the conceptual map of peasant farming produced by Van der Ploeg in his excellent 1999 book "The New Peasantries," that does an excellent job of describing the reality of permaculture farms, as a starting point. I add some more descriptive text, and then add an overlay (black boxes and arrows) describing the patterns and strategies of permaculture farmers in the US.

side, cooperatives structures that allow farmers to collectively own equipment and processing infrastructure are crucial.

For the latter category, though - the counterintuitive imperative of helping people pay more for food - there are fewer obvious models to turn to. Govern-

mental and NGO programs that support the use of coupons from the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and Electronic Benefit Transfer programs (aka food stamps) at farmer's markets, and Farmer's Market Nutrition Programs that provide coupons for elders, are all examples of work to enable people to pay a

fair price for good food. Getting the government to spend a little to subsidize the very farmers who have been targeted by decades of policy war is certainly a better use of funds than producing arms or subsidizing corn. But we need to think deeply and laterally about a more systemic solution, which must involve lowering the non-food cost of living. People outside of the US are able to pay more for food because they pay less for other things. And the poorer someone is, the higher proportion of their income they spend on non-food essentials like medical expenses, extortionate rent, maintaining a clunker vehicle, etc. Whenever we can reduce non-food costs like these, we increase our capacity to make different food spending decisions, and to support farmers who practice regenerative agriculture by paying more for food. This is where frameworks like Solidarity Economy and Transition come into play (Hopkins 2010; Delambre 2011; Lewis and Conaty 2012). Innovative models for cooperation and sharing of resources are vital for bringing down the cost of non-food essentials so we can pay a fair, proportional price for food. Lowering non-food costs isn't sufficient to guarantee that we will make better food purchasing decisions, but it is absolutely necessary in order to create the capacity.

*Nationally and Globally: Shutting down the Hose.* Finally, we have to call off the policy war altogether. This involves changing research priorities, phasing out subsidies (and their reincarnation in the form of crop insurance), offering better incentives for good stewardship, and last but not least radically altering trade policy. These issues are beyond the scope of this article, but it's worth asking: what kind of Farm Bill would a permaculture policy thinktank propose? What would a permaculture platform on international trade policy look like? The Land Institute works in this mode, as do our fellow travelers in Via Campesina (Jackson and Berry 2009; Via Campesina 2012). What kind of institutions would we have to build, in order to have something meaningful to offer those conversations?

## Conclusion

Research on permaculture through multiple lenses suggests that we have our work cut out for us - and that we need to approach that work in new and unfamiliar ways. There is ample scientific support for much of what we propose, and yet we oversimplify ecological concepts and underplay complexity and risk. We are in many ways a diverse and resilient movement, but we are also replicating toxic patterns around race and gender that will, if we allow them, prevent us from achieving our goals at any scale beyond the private landscape. Our growers are doing amazing and innovative work developing multifunctional diversified farming systems, but we are still operating in a production bottleneck, caught between the time needed for system development and farmer learning on one hand, and hostile policy and market forces on the other.

Permaculture is vast, it contains multitudes, and no single view of it is nearly adequate for understanding. The three lenses on permaculture I've addressed here aren't adequate either - not for thoroughly understanding permaculture, nor for figuring out our grand strategy for the coming decades. But I do believe they are a contribution to that work. I hope that, at least, these projects can represent the very modest beginning of a new phase for permaculture. After all, it's safe to say at this point that **we're here**. And as our existence as a global phenomenon becomes more assured, more and more permaculturists can start asking big questions: Who are we? Where do we stand with science? **What's happening on the ground?** And further, with all the questions I haven't addressed here, and all the questions none of us now have ever thought of.

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