

This document is a preprint of an article that was accepted for publication Mar 24 2014. The text of the final published version may contain minor differences with this preprint.

Toward 21st Century Permaculture: Peoples' Science or Pseudoscience?

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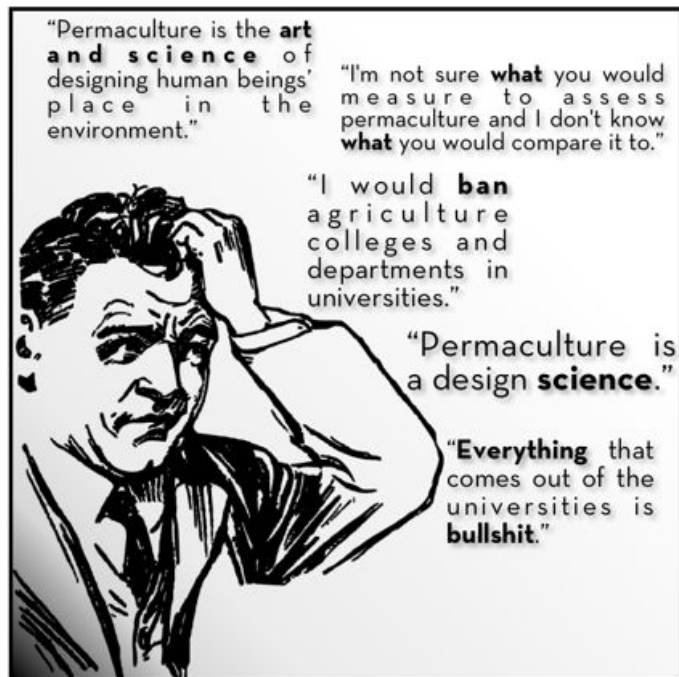
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This article is adapted from a talk of the same title given at the Int'l Permaculture Convergence in Jibacoa, Cuba, December 2013.

Permaculture has a complicated relationship with science.

Holmgren and Mollison's partnership emerged from an academic context and then left it behind. As they forged the permaculture perspective they broke up with institutional science, and devoted their energies to deepening practice and birthing a movement. They had good reasons for abandoning academia — in the 1970s, there was virtually no scientific research to support the practical proposals they were making. Science wasn't ready.

For the past 34 years, permaculture has largely stayed on the track of an independent grassroots movement, and distant from systematic research. If you search the massive databases of peer-reviewed scientific literature, there is very little (but not quite zero) mention of permaculture. That's not necessarily a criticism of permaculture's history — we've been busy growing a movement, project by project and course by course. In those decades, though, the context has changed. Permaculture has fellow travelers and allies among newer scientific disciplines: agroecology, agroforestry, ecological waste and water treatment, resilience science, and others. The context has changed, and our approach needs to change too.



With all these statements from prominent permaculturists floating around, it's not hard to feel a little confused about the relationship between permaculture and science.

Our isolation from science has complicated consequences. One of them is that permaculture gets labeled as pseudoscience. It's expected that radical proposals will get called names, and we've

been called our share. Many of them we can disregard as driven by ignorance and fear. But this is one that I believe we should take seriously.

Pseudoscience is

- 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.
- 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.

(adapted from <http://en.wikipedia.org/wiki/Pseudoscience>)

Why should we take this seriously? For one thing, because many of us are interested in presenting permaculture as science-based, despite our relative isolation from research. For another: let's face it. In all the diversity of styles and practices with which people promote and defend permaculture... sometimes we deserve it. I don't think that anyone who has been involved in permaculture for more than a few years could read the characteristics of pseudoscience and not have some of them seem familiar.

We also need to understand it. Pseudoscience is not just a label that we want to avoid, it's also a style of thinking that - when we fall prey to it - handicaps us. We need to move further, learn faster and think more critically if we are going to accomplish our goals. Thankfully our choice isn't between the shoddy thinking of pseudoscience on one hand and all getting trained as scientists on the other. We have other alternatives that will serve us better.

Thinking Through Permaculture Science

I think of our best alternative as **Peoples' Science**. I define it as

a culture of experimentation and critical thinking that mobilizes the resources of contemporary scientific research, and integrates them into our movement for the liberation of people and of our home the earth.

So where do we stand, right now, in relation to our closest allies in the sciences? To try and begin answering that question, I conducted a systematic review of the permaculture literature 2012 and 2013 (Ferguson & Lovell, 2013). I will be giving a more thorough discussion of that project in a following issue of Permaculture Activist, so I won't say much about it here. In broad strokes, permaculture principles and proposals are extensively supported by contemporary science. The concepts and strategies emerging from the permaculture literature largely complement, and in many cases provide a provocative extension of, those in the agroecology literature. As much as we have to offer, we also have our work cut out for us. Our literature shows that we have a weakness for extrapolating from ecological principles in a way that severely oversimplifies the

processes at work, and for then making claims and prescriptions based on those principles that overreach what we really know how to do. Discussions of practice consistently underplay the complexity, challenges, and risks that producers face in developing diversified and integrated production systems.

My goal in proposing the concept of Peoples' Science is to help strengthen our movement, by nudging us toward a healthier and more critical attitude toward science, and nudge us away from that part of our legacy that relies too heavily on charisma and plays too loose with evidence.

What's at stake? Occasionally getting targeted with the label of pseudoscience is not the most serious consequence of our isolation from science. There is more at stake. We are starved for feedback. How are we, as a movement and as practitioners, doing? What are the criteria by which we would even begin to answer that question? We've been going at it for 35 years without ever collectively and systematically assessing our impact. It's ok - we've been busy. But on the face of it it's clear that this has to change. All the learning we've done at the site level is stupendous, but without a way to rigorously examine how we're doing across many sites and conditions, we're not learning nearly fast enough to keep up with the pace of history.

The view from the margins is getting old. We risk being wallflowers at the dance party of global change. Our ability to value the marginal is a strength, and we shouldn't abandon it. But which margins? And do we have to be **on** the margin to **value** the marginal? Consider the report "Agroecology and the Right to Food," submitted by UN Special Rapporteur Oliver de Schutter, that made a big splash in 2010 (De Schutter 2010). The main message of the report is that agroecology is the solution to the global food crisis. Permaculture is not even a footnote. Consider also how agroecology has been adopted by Via Campesina, the international peasant farmer federation with 600,000,000 members. (That's not a typo - *six hundred million*). They've adopted agroecology, but they don't mention permaculture (Rosset and Matinez-Torress). Is it *really* because our mulching techniques are so subversive? My concern isn't that we're getting left out. I don't care about the turf. It's that we have a contribution to make that to those conversations, and that contribution is *not getting made*. We're not where we need to be to do what we need to do.

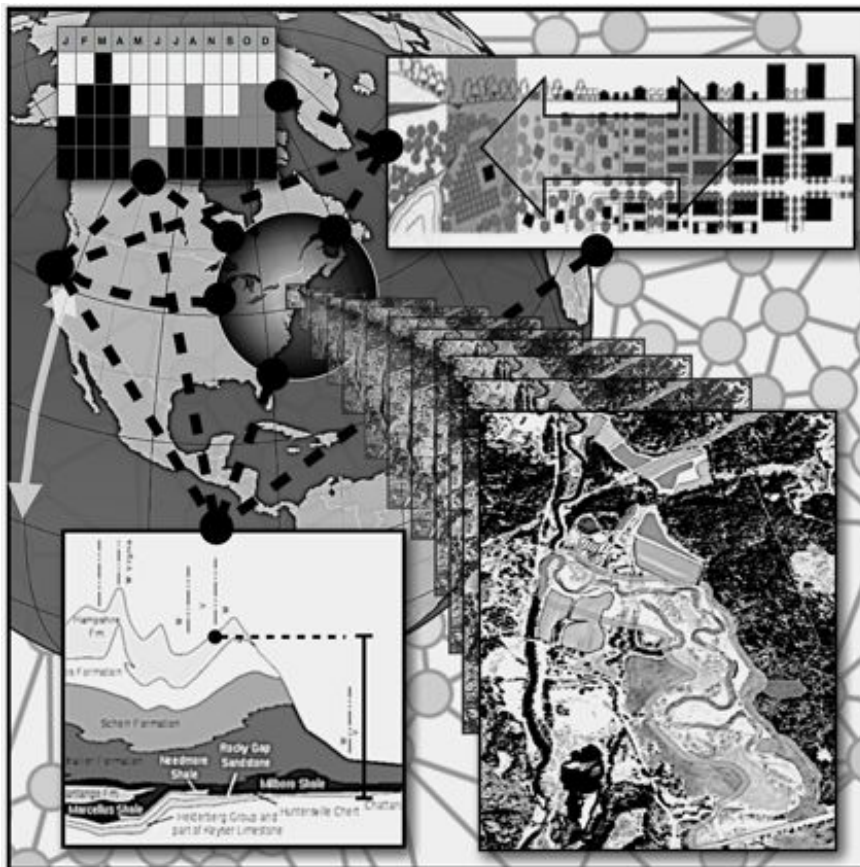
How might it look? Broadly speaking, there are three mutually compatible strategy we can use to get there. Perhaps the most obvious is the one in which permaculture is explicitly investigated or discussed in scientific literature. When permaculture is either the subject of research, or an explicit frame for organizing theory and investigation, that's a powerful statement and a resource for us. Another strategy is that permaculturists simply start paying closer attention to the recent decades and emerging wavefront of relevant research and theory. I'm grateful to Chris Warburton-Brown and all the good people at UK Permaculture, for starting the Permaculture Research Digest, which "provides summaries of newly published permaculture-related research." This pattern is especially important for promoters of permaculture - teachers and writers. There are, of course, many permaculturists who do pay attention to what's happening in scientific research, but more widespread and current scientific literacy can only help us.

The third pattern is the most important: permaculturists do science. By “science” here I don’t mean working with large institutions and publishing in peer-reviewed journals (though that can be worthwhile). I mean a more fundamental notion of *systematic collective inquiry*: careful and strategic investigation of shared questions, critical interpretation of what we find, and systematic dissemination of questions and answers. This is not something we need big institutions to do - though there are certain questions that their resources will be very useful for. Rather, this is an evolutionary extension of what we are already doing. This is how we learn faster.

Transitional Concepts

In grappling with some of these questions, two constellations of ideas have helped me think things through. I’ve been inspired the incredibly body of scientific research, spanning many disciplines, that falls under the rubric of Traditional Ecological Knowledge. The lesson that strikes me from the global body of research *about* TEK is the way things vary between pattern and details. The global patterns in broad land use strategies are very, very strong: homegardens, coppice management, silvopasture, fishery (and other common resource) management, swidden agriculture and shifting cultivation, water-harvesting earthworks, et cetera. These patterns of management occur independently, again and again, all over the world. And with that very strong pattern at the global level comes wild variation in the details of management at the local level - even

from watershed to watershed. The patterns in strategy are stable, the details of technique are extremely variable (Berkes 1999).



Global gradients like tropical-polar, humid-arid, each shape landscapes and inform design in predictable ways. The interaction between all these gradients may not be predictable, though.

I want to ask myself - does my teaching reflect this? Do I ground my discussion in an awareness of the very different stability factor in pattern vs. detail, strategy vs. technique? When I catch myself dogmatically insisting on the permaculture recipe for swales, for example, it’s good to remind myself of (and share with my students) the incredible variety of water-harvesting earthworks that have been developed in different landscapes and cultures all over the world, over millennia, *specifi-*

cally to fit those contexts. When am I teaching one-size-fits-most recipes, and when am I teaching design that responds to the environmental and social parameters of a site? When am I teaching not only a powerful example of technique, but also the broad forces that drive the global patterns *and* the local variation?

Building on those questions, I turn to Movimiento Campesino a Campesino, the Farmer to Farmer Movement that has formed a learning network linking hundreds of thousands of farmer-promoters across villages, regions, and nations. In particular, to the movement in Cuba, from whose agroecological transformation so many permaculturists have taken so much inspiration. Their perspective on technique is informative.

“The MACAC [...] speak more to social process than specific technologies. La Via Campesina has found that there is no real need for agroecology to promote specific techniques of food production. There are already many good practices available. The problem is that in most cases, the dissemination and adoption of sustainable practices are limited by methodological shortcomings. [...] It was clear that widespread transformation would be impossible without a methodology to build a social process to accelerate adoption of agroecology. Though agroecological techniques abounded, Cuba needed to develop a process by which to better disseminate them and foment their adoption.” (Sosa et al. 2013)

While the identification and development of techniques are absolutely necessary, techniques themselves are not the crucial linchpin holding us back. Technique is, if anything, the easy part. The critical unmet need is the social process that facilitates the identification, development, adoption, implementation, dissemination, and adaptation of techniques across sites and social contexts.

So I ask myself again: does my teaching reflect that? Does our movement reflect that? So far my best answers is not enough.

Principles of People's Science

I want to offer some preliminary efforts at defining some principles for accelerating learning in permaculture. While I've grouped them based on whether they apply more to practitioners, promoters, or everybody, in truth they all go both ways.

...for teachers and promoters

Show Your Work. Know and share the origins of the concepts you are teaching. Don't teach anything as 'received wisdom' if you can help it. Even if the principle you are teaching seems to be universal, the way it's being talked about has a history. Refer to it.

One way this can look is to cite your sources - especially when you are drawing on factual claims. This not only gives you credibility, but it also is an act of generosity to your audience. You take yourself out of the role of gatekeeper for the work of others that you have benefitted

from, and let people pursue and access those resources themselves. I promise it won't clutter up your slides too much.

Teach the Dynamics. Do teach the forces that drive the big patterns and those that drive the fine-grained site specificity. Do teach recipes in that context, as a way for people to wrap their head and hands around one viable approach.

We can do better than teaching only macro-regional design templates. We will better equip our students by also teaching the global gradients that each drive ecosystem processes in predictable ways, and all intersect to shape specific sites: tropic-polar, arid-humid, flat-steep, lowland-highland. This applies as well to socio-ecological gradients: urban-rural, production-subsistence, fertile-barren, intact-degraded, wealth-impooverished.

Teach the Controversy. When we teach concepts as received and accepted wisdom, there are consequences. We may get converts. And most of us are probably aware, and many have personal experience, of fresh-faced PDC graduates going out into the world and telling farmers that they're doing it wrong, asking researchers why they don't just get on board with permaculture since it definitely works everywhere and will save the day... and worse. Pretty much everything someone could do to put their foot in their mouth and make permaculture like a gonzo cult is happening, in all likelihood, every day.

We can't actually prevent people from doing that (and it's not just fresh-face students, alas). But we can inoculate against it. So when you teach the content, also teach the disagreement. Teach the questions and contention around a concept or technique. Not only is it often the most interesting thing about a topic, it's also the information that *actually* equips your students take these ideas into the world and advocate for them.

Lose the Smoke and Mirrors (Don't Mystify Your Audience). Do be reflective about your language. Avoid needless jargon. Special and technical vocabulary should be used only when it adds clarity. Resist the temptation to make things sound sciencey. Conversely, resist the urge to explain things in cosmic or mystical terms. (An in terms of both science and mysticism, let me note that I'm pretty confident that there are no phenomena relevant to permaculture design that are clarified by referring to quantum physics in any way.)

Balance the Narrative. Don't choose between a inspiring, motivating message, and a critical, and reflective one. We don't have to rely on certainty to excite people: we can also engage people by including the open, burning questions that are embedded in our work. The urgency for implementation that we convey is not only so that we can solve problems that confront us, but so that we can iteratively *learn how* to solve them.

...for everybody

The next two principles are a matched pair, both having to do with distinguishing between experiential claims and sweeping claims. We need to notice the scale that a statement is being made

at, because they require different responses. Is it "I did this, and this is what happened" or "Whenever anyone anywhere does this, this is what happens?"

Hone Your Bullshit Allergy. When you hear a sweeping claim, question it - at *least* to yourself. Ask: "How do we know this is true? What's being left out of this description - ecologically, socially, economically? What more do we need to know in order to act on this claim?"

Practice Skeptical Humility. When a practitioner (especially one who isn't trying to sell you something) talks about their experience, and it doesn't jibe with your understanding, suspend belief/disbelief. Just take it as one data point, and add it to the pool of questions and information.

We can start practicing, of course, by turning these questions on ourselves.

Don't Filter the Feedback (Don't Mystify Yourself). This is best said as simply as possible, and reflected on daily:

Value the evidence that refutes your theory, as well as the evidence that confirms it.

...for practitioners:

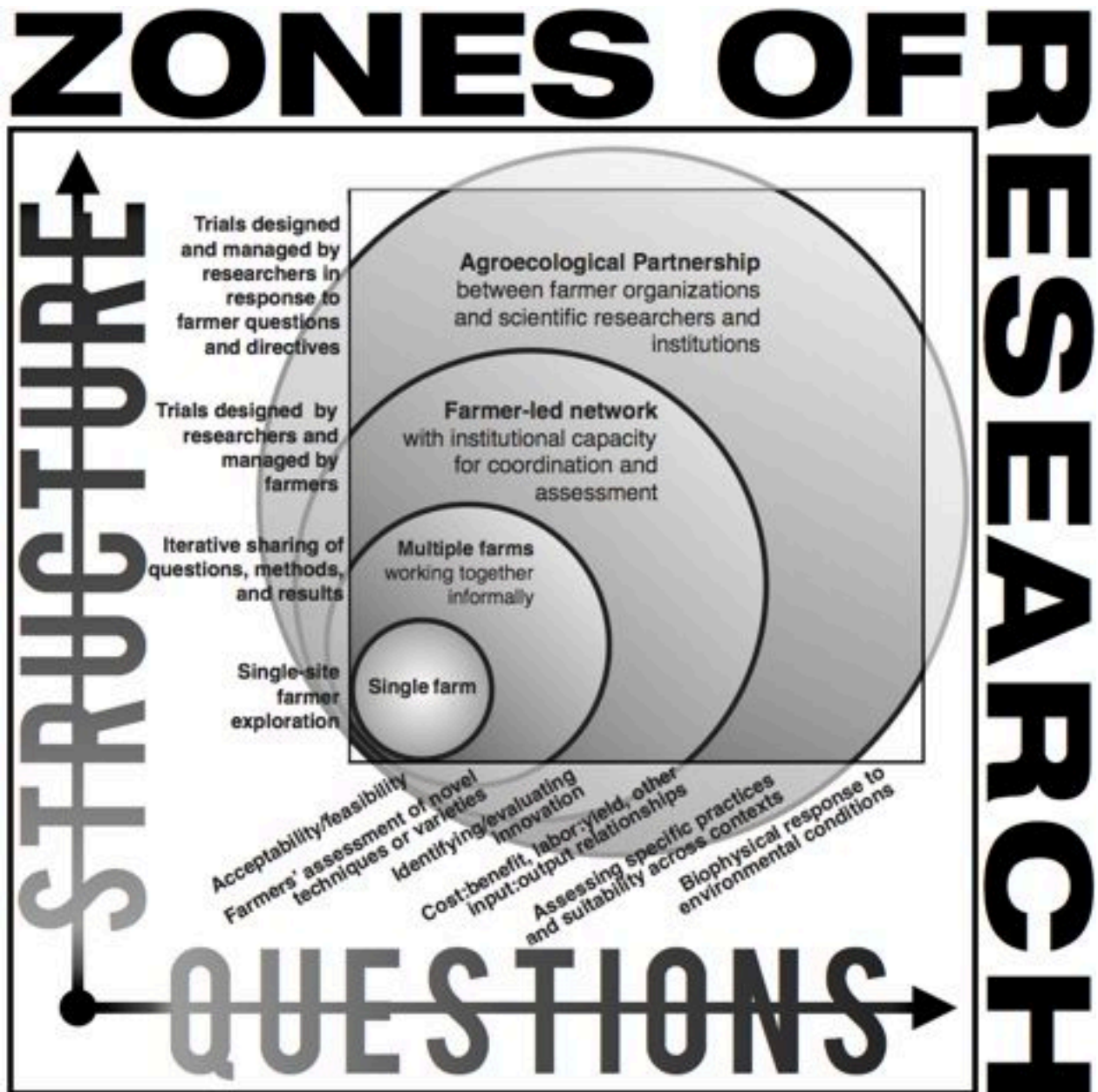
Design for Comparison. Assessing our impact, and figuring out what works, means that we have to identify causes. This is tricky. You can't have a garden for very long without noticing this. If we do something, things change. If we don't do something, things still change. We can, however, design our interventions so that we can best assess their effects.

In practice that means that when we apply a new technique, we retain a *control* plot that doesn't get the treatment. Because so many factors change from year to year, the control plot lets us allow for all the year-to-year variation and still have some useful insight into the effect of our new technique. This can also mean gathering *baseline* data across a site before we intervene at all. By documenting conditions across a site, we get another kind of insight - into change over time. This can complement the use of control plots. As control plots help us allow for yearly variation so we can track change between different areas (with different treatments), baseline data can help us allow for *spatial* variation, and give us insight into processes of change over time.

Design for Partnerships. Trying out a new variety or a new compost formulation is one thing, but as questions become more pressing and complex, they can't be adequately answered by one practitioner or on one site. In the spirit of systematic collective inquiry, we need to share common questions, methods for investigating them, and the answers we come up with. It's not only the inquiry that needs to be systematic - it's also about working collectively. Far more needs to be accomplished than we can do without coordinating our efforts.

Different questions demand levels of partnership and coordination. Different levels of coordination require different kinds of institutional capacity. While there is no shortage of work to do, we

have everything we need to begin. The Zones of Research figure is offered as a way of thinking about relationships between the scale of partnerships, questions, and structures for research (inspired and informed by Xu et al. 2011, free download link in Further Reading below).



Different kinds of questions need different levels of partnership and coordination. The most pressing and important questions are sometimes the ones that are most complex to answer.

In Conclusion - Facing the Dual Nature of Science

In proposing a reinvigorated relationship between permaculture and scientific research, I hope it's clear that I'm not proposing that we put institutional peer-reviewed science on a pedestal. It wouldn't be of any benefit for us to trade in charisma for institutional affiliation as the sole source of credibility. We need to face head-on the dual nature of science (Levins 1992). On one hand it actually enlightens us about how the world works, and by mobilizing its resources we learn things about the world that we might not be able to learn any other way. It's also the case that science always emerges from a particular social and political context, and is always shaped by that context - sometimes subtly, sometimes obviously. We don't need to follow the so-called 'skeptical' movement in fetishizing the outputs of big-money science, as if those institutions are truly the Unstoppable Truth Factories that the Western mythology of science would have us believe. We need to think deeper and further than that.

This is why permaculture needs Peoples' Science. These tools - both conceptual and physical - are rightfully ours. They are too useful to abandon to the institutions that claim them now. We can reclaim their power for our movement - both by mobilizing and re-appropriating existing resources, and by just doing science ourselves. It's not a trivial task, but a lot of work has already been done. Many useful frameworks for doing participatory research have been developed over the last three decades - going by Participatory Rural Appraisal, Community Participatory Action Research, Participatory Learning and Action, and a dozen other recombinations of those terms. But those frameworks are written by and for professional researchers. We can and must develop the other side of that equation: systematic collective inquiry working from the grassroots up. The permaculture movement is great at assessing and integrating new techniques and practices into our framework - that's where virtually all our technique comes from. We can turn that integrating gaze on the techniques and the products of scientific research, and repurpose them for the liberation of ourselves and our home. We need to be learning faster in order to do the work that we need to do. The culture of experimentation and critical thinking that will allow us to collectively see further, think deeper, and learn faster, is just waiting for us to bring it to life.

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Xu J, Kim K, He J (2011) Participatory Agroforestry Development in DPR Korea. World Agroforestry Centre (ICRAF), China and East Asia Node, Kunming

Further Reading

- Participatory Agroforestry Development in DPR Korea
<http://www.worldagroforestry.org/downloads/publications/PDFs/B16990.PDF>
- An Agroforestry Guide for Field Practitioners
<http://www.worldagroforestry.org/downloads/publications/PDFs/B17460.PDF>
- Improve Your Gardening with Backyard Research
<http://www.amazon.com/Improve-Your-Gardening-Backyard-Research/dp/0878572678>
- On-Farm Research Guidebook
http://web.aces.uiuc.edu/vista/pdf_pubs/GUIDEBK.PDF
- UK Permaculture Research Digest
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