

# The Great Simplification

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David Holmgren (00:00:00):

We don't face a future where one big solution trumps all. When people say, "Oh, but not everyone could do that," that is a sign of the thinking that comes from the fossil fuel era, where there's been one big solution that actually works everywhere. That's not the future we're facing. There's lots of little different things of both energy sources and ways of doing things.

Nate Hagens (00:00:29):

Joining me today is David Holmgren, who, along with Bill Mollison, around 50 years ago, designed the concept of permaculture with their book *Permaculture One* back in 1978. Since then, David has developed three properties in Australia, consulted and supervised on urban and rural projects, and written many more books, of which I have several. Within the Permaculture movement, David is committed to showing, by personal example, that a sustainable lifestyle is realistic, attractive, and a powerful alternative to dependent consumerism. Please welcome David Holmgren.

(00:01:25):

Hello, David Holmgren. Great to meet you after all these years.

David Holmgren (00:01:30):

Great to meet you, too, to join you on this fantastic podcast of yours.

Nate Hagens (00:01:36):

I've known of your work for 20 years, plus or minus. Let's get right into it. I've had several permaculture experts on the show. However, you're actually one of the co-founders of permaculture. In your words, could you briefly describe what is permaculture and how you first became interested in it?

David Holmgren (00:02:02):

I am one of the co-origins of the concept and was the co-author, with Bill Mollison, of the first book published in 1978 based on our work together in the early and mid-70s. But I, of course, acknowledged him as the father of the permaculture movement. As it grew beginning in the '80s, I was more of an observer of that process rather than a founder of the spread of permaculture as a movement, which has

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happened through a lot of mechanisms, but especially the permaculture design course, often in a residential form, where people had a deep immersion experience in the ideas.

(00:02:51):

But those ideas are really... Often, people think of it as a cool form of organic gardening or something like that. Gardening is a very important application of permaculture. But permaculture, at its essence, is a design system. It's a design system for resilient and regenerative land use in all its forms: gardening, farming, forestry, aquaculture, but also resilient and regenerative living. That's that permanent agriculture and permanent culture. Redeveloping or developing a permanent/a perennial... We used the word permanent before the sustainability discourse in the 1970s. This resilient and regenerative culture expresses itself in a grassroots ground-up/build from the bottom through behavior. We can think of that as living and land use design system for resilient and regenerative living and land use.

Nate Hagens (00:04:26):

You said three times there... You distinguished resilient and regenerative. How could I think about the difference between something that's resilient and something that's regenerative?

David Holmgren (00:04:40):

Yeah. Well, firstly, the resilience concept, of course, has come into discourse beyond the sustainability discourse of recognizing the ability of systems to withstand shock and bounce back, not necessarily to exactly the same state, but to recover basic function. That concept is in attention with the drive of our civilization and often individuals towards efficiency so that... It's like backup systems. It's like insurance. It's like having the flexibility/adaptability, which all comes at some cost to a focused efficiency. That, in practical terms, means things like storages of water, storages of basic needs, multiple pathways to achieve things. As we said in early permaculture teaching, every important function is supported by many different elements and pathways.

Nate Hagens (00:06:03):

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If you have to support every function by multiple pathways, that makes it less efficient and perhaps less profitable and perhaps less chosen by our current system, but more resilient to unknown futures. Yes?

David Holmgren (00:06:16):

Yeah. Whereas the regenerative is going beyond environmental thinking about minimizing adverse impact. Actually, what human systems are doing are regenerating the resource base that supports those systems. That can be from natural resources of soil, forests, biodiversity, and all of the other important renewable resources and also the social or cultural resources and, of course, dealing with the issues of depletion of fixed stocks, which is always a problematic issue of how a system deals with fixed stocks that cannot be regenerated in any reasonable time, which is the fundamental problem for our civilization, dealing with depletion of fossil energy.

(00:07:28):

That regenerative culture... The origins of it in the permaculture lineage come from the pioneering Australian farmer and land use visionary, P.A. Yeomans, who critiqued the whole soil conservation culture about... That's not good enough. We've actually got to be building soil rather than just saying we're not losing what's taken thousands of years to create. In the 1950s and '60s, he was saying through broad acre management of land, we can actually not just recover the damage but actually create soil. Now, the limitations of that and whatever can all be debated. But that idea that what humans do can actually not improve on nature in some mental way but can actually restore and extend natural systems and their functionality rather than just minimizing impact is a very key distinction from most environmental thinking.

Nate Hagens (00:08:47):

If you had to guess... And I doubt anyone has the answer to this. But of all the soil in the world that humans are planting in order to get crops or food, what percent of that is actually being done in a regenerative way that it's building the soil and adding something back in the way that you just described?

David Holmgren (00:09:15):

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I would say a fairly small percentage. Ironically, some of that is actually happening through processes that are actually not intentional, perhaps even more than the designed regenerative agricultural activity. For example, many areas that became uneconomic in our centralizing system went back from being cropland to pasture land. In that process, even not necessarily the best grazing management of intensive rotation or whatever... That soil is actually rebuilding under those pasture systems. A lot of people will be quite surprised to hear that. But that's certainly possible in our own country and in places like the United States and Europe and Japan, other affluent places. A lot of land has actually become retired from intensive use, I mean, often at the cost of land elsewhere.

(00:10:25):

Then, another big process, which is even more dramatic, is the regrowth of forests around these affluent communities. Everywhere I've been, in the affluent world, there's this regrowth of forests because people are living out of the oil well instead of out of those forests. That regeneration that's actually happening is one of the untold stories as just an ad hoc byproduct of urbanization and increasing dependence on resources via those that are supported by fossil resources and the intensive degradation of large-scale tracts of land, often in remote hinterlands and in other countries. Those processes are actually bigger than the very substantial and important efforts at organic and regenerative forms of agriculture, of which permaculture has only been one small influence in that world.

Nate Hagens (00:11:34):

I read on your Wikipedia page that you were... I didn't know this until this weekend: that you studied and were influenced by Howard Odum, H.T. Odum, who also influenced a lot of my thinking. I didn't know that.

David Holmgren (00:11:49):

Yes. Well, *Power, Environment, and Society*, 1971, is the first reference in *Permaculture One*. I read that in 1973. Very difficult text. At the same time, I was reading... of course, influenced by the Club of Rome, *Limits to Growth* report and many of the ideas... E.F. Schumacher, *Small is Beautiful*, and also *Ecological Interpretations of the Decline and Fall of the Roman Empire* by Edward Goldsmith/Teddy Goldsmith in the *Ecologist*

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Magazine was an amazing influence on looking at this ecological interpretation of past human systems. But Odum's framework of using energy as both a language to understand natural ecosystems, human-modified ecosystems, and, in fact, human societies and a currency to actually evaluate very different types of inputs and outputs was, for me, really transformative and was a strong influence right through my articulation of permaculture. Whereas I think Bill Mollison, who was... Although he referenced such work, he was more strongly focused on how the creative design can overcome limits, whereas I was a bit more doer about there's no free lunch. Odum's messages about understanding what is the physical and energetic basis of our existence was a stronger part of that work.

Nate Hagens (00:14:07):

Well, as far as currencies go, though, we didn't use energy as a currency because, according to Odum's own maximum power principle, it's much easier to print money and print debt and new credit than we can spend on energy. Energy is the ultimate currency. But we can create markers to get it faster. I wonder what he would say about that were he's still alive.

David Holmgren (00:14:36):

Yes. Well, of course, my book, *Permaculture Principles and Pathways*, was dedicated to his memory. In my second phase of focus on his work in the early '80s, I was very hopeful that his advanced form of embodied energy accounting, that became called energy accounting, would give us a way of actually trying to understand the complexity of human systems and lead to some possibility of holistic thinking around those, even if it wasn't actually a replacement for money in practical everyday business.

Nate Hagens (00:15:31):

I also read on your Wikipedia page that you had the highest grades in your high school class. But it went unrecorded because of your dissident nature. I'm just wondering, given our industrialized world and the narratives, does it take something of a dissident nature to dedicate one's life and one's efforts to permaculture or what

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you've done? Does it take that rebel spirit when the rest of the world is going a different way?

David Holmgren (00:16:04):

Well, I think that there was an element of that even though we're a generation different in different ways, in both my own lineage and background and Bill Mollison's. In my own case, my parents were radical leftist political activists. I grew up with the campaign against the war in Vietnam and, before that, the Ban the Bomb marches, and grew up with parents who were atheists and into whole foods that made my peers at school look at the strange things we ate and all of those things of being used to being an outsider. That is, if you like, a psychological/comfortable space for me.

(00:17:09):

I suppose there's a tendency to fall into that by default of being the devil's advocate, especially when a consensus forms even around some of my own ideas. I have a record of being the kicker of permaculture sacred cows or the potential emergence of those within permaculture thinking over the decades. I can see a lot of people who've been pioneers in permaculture have that fringe dissident thinker, activist approach in all sorts of different ways. That can be a limitation, too. But there's also always that process when ideas become mainstream or adopted in society. There's a compromise with some of that radicalism. Some of that is just the natural process of things being absorbed and adopted.

Nate Hagens (00:18:19):

I have lots of questions on permaculture and your work and your books. But let me just ask you. There was so much... And you mentioned E. F. Schumacher and H.T. Odum and Limits to Growth. We were close to an awareness and even a practice on some of these things 50 years ago. Then, we went to debt. We went to globalization. We were off to the races. It was swept under the carpet: these limits and these other concerns. Do you ever feel like the last 50 years were wasted by what was possible for humanity to do?

David Holmgren (00:19:01):

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Yes. As my own version of being an uneducated historian in the lineage of my father, who left school at 14 and was probably the most influential-on-me historian in his own way of the world he lived through, I have a particular view of that lifetime. I suppose I try and explain that to younger people through saying, "In 1977, 15 publishers approached a cantankerous unknown academic and a completely unknown graduate student wanting to publish the manuscript of Permaculture One. What the hell was going on in 1977 for that to happen?" I've also predicted that if that had moved forward to, say, 1984/85, that permaculture as an idea, if it had been published, probably would've sunk like a lead balloon because we're already into what I used to call the Thatcherite/Reaganite revolution, the neoliberal revolution.

(00:20:24):

Of course, there was a second great wave in the late '80s/early '90s, which, again, permaculture grew on that wave. Mollison's great encyclopedic Designer's Manual was published in 1988. That caught exactly that second wave that was involved: sustainable development and a shift in a way of what we could call sustainability, thinking away from a lot of the biological and cultural and behavioral change elements that were strong in the 1970s wave and became more narrowly focused around tech and the metric of greenhouse gas emissions. A whole generation of environmental activists and entrepreneurs and politicians threw away all of the failed alternative ideas/hippie ideas, got on the suit and tie, became evidence-based, and focused around the limits of resources, which was the big issue that drove the first wave because it coincided with the Yom Kippur War and the first and second oil crises, maybe the limits of sinks, using the limits to growth metric language in climate change, was the thing that was going to bring about the great change.

(00:22:09):

I have this wave theory that I've never written out at great length or researched that there's these pulsing waves where these new ideas come and change things. But then there's a reversal. But to some extent, there's a consolidation also that happens at the fringes in those periods. Then, there's another wave. Those waves are intensifying and getting shorter and shorter. It's harder now for me to see and document those recent waves. But I did see the 1970s one through to maybe 1981/'82 and then '88 to '92. Then, in '99, I saw a third wave, but it was sort of stillborn by the events of September the

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11th and the War on Terror and regime change. But since the 2000s, there's been this increasing frequency and intensity of waves where these ideas come back and, obviously, change and adapt to the context of the times.

Nate Hagens (00:23:28):

Is permaculture inherently a practice of re-localization? 'Cause some people talk about scaling up permaculture practices. Would that be a paradoxical idea, then? I mean, can it be scaled?

David Holmgren (00:23:43):

To some extent, adoption into the existing systems always involves scaling up because things become energy-dense, basically fossil-fueled or indirectly powered. Fossil fuels natural scale is not human scale. All of the discussion endlessly, for example, in the urban planning debate about how do we get human scale cities... Well, sorry, our cities are designed around fossil fuel scale, which is inevitably inhuman.

(00:24:19):

When the energy density goes down, you get human-scale systems designed or undesigned again. Understanding that driver that these things are not just primarily choice... A lot of permaculture thinking being adopted into, for example, mainstream agriculture inevitably involves larger scale. Those inevitably involve contradictions of the direction we'll need to go with lower energy density in an energy descent future.

(00:25:01):

But I think when people talk about scaling, they often miss that there's two different ways. You can scale by growth of systems, and you can scale by replication. Viral replication is actually a faster, in some cases, but also a less risky and higher learning pathway by lots and lots of copying and morphing and modification of small-scale systems. That basic debate about scaling often is confusing. I see no contradiction with the viral replication other than the problem of very rapid viral replication can lead to just fashion templating copying without adaption. But you can get-

(00:26:02):

But you can get scale effects by that. So we can think of the viral replication in the suburbs of garden farming to support household and community. Non-monetary

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economy has the potential in long affluent countries to take a significant chunk of the whole food supply pathway, and that could happen relatively rapidly. And that's a scaling.

Nate Hagens (00:26:38):

John Michael Greer often says, "Collapse first and beat the rush." And sometimes I say simplify first and beat the rush. If you think that we will have to have relocalized smaller scale futures that will be designed or undesigned, would you advocate for permaculture first and beat the rush so that we have a little bit of design on how it looks ahead of the time when it would be forced upon us?

David Holmgren (00:27:09):

Well, that's exactly from my perspective what permaculture was designed for. How do you model these things ahead of urgent necessity? So you have the freedom of time and the resources of affluence to experiment and make lots of small mistakes, lots of small trials. And what better way to do that where people who have the enlightened self-interest to say, "This is a better way to live for me. And I will take my idealism or my crazy ideas and be the guinea pig of my own ideas and see if one person, households, communities making that intentional change can do this stuff." Now, you can say that that is against the tide of the larger structural systems in society, which makes it very, very difficult to do. But it's also you get... If you're on the right path, you get the early adapter advantages.

(00:28:21):

So for example, one of the strongest elements of permaculture projects around the world, more than forms of ecological agriculture or ecological building is creative reuse. If you like scavenging from what the system is discarding and the huge opportunities there are to redesign and adapt and retrofit things because the system is just so wasteful. So for people who have just get all of their clothes from the opportunity shops, it's easy to say, "Oh, but not everyone can do that because it depends on the endless, unnecessary affluent consumers who are doing the purchasing." Well, that's one of the advantages you have as an early adapter, collapse or simplify first is that it's very appropriate. But that's part of a learning process that also we don't face a future where one big solution trumps all. So when people say,

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"Oh, but not everyone could do that," that is a sign of the thinking that comes from the fossil fuel era where there's been one big solution that actually works everywhere. That's not the future we're facing. There's lots of little different things of both energy sources and ways of doing things.

Nate Hagens (00:29:57):

So permaculture is inherently decentralized. Is it possible for us to have both, where we have a global civilization right now as currently all in on large-scale efficiency systems? Should we swing the pendulum the other way, or are there limits to that? The same thing with renewable energy. 20% solar in an area is really good. But 80%, then we have problems with affording the backup plants and the transmission and everything. Is there a middle ground while everything is still holding together for decentralized pockets of permaculture and similar things to combine and be at the same time as the large-scale fossil system? What are your thoughts on that?

David Holmgren (00:30:48):

Yes, I think they are directly complimentary, but I don't see that happening through sensible, logical, top-down policy change. I think that happens in a way that is partly parasitic where those new systems develop in the shadow of large-scale centralized systems. And there's actually complementarities because they're actually modeling pathways that might be necessary for change. So for example, in the food supply system, my essay, Feeding RetroSuburbia from the backyard to the bioregion is postulating what a localized food system around a city like Melbourne of several million people might look like feeding not 100% of the population, but 20% of the population. Assuming that the centralized system will be one of the last things that central government actually maintain and support if it's the last thing they do.

(00:31:59):

So those systems are not going to just go away or be changed, they'll become armored and more centralized. But building a parallel food system is both something that can engage those who see it as a positive action for themselves, so this enlightened self-interest. It can be then a model for if society got to energetically realistic, common goal policies, then actually, "Okay, how do we design this sensibly

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over multiple generations?" And it can be a lifeboat in the sense of actual failures and large-scale collapses of those more centralized systems.

Nate Hagens (00:32:54):

So this gets back to your replicating comment. You are in Victoria, which is in the south of Australia. And I'm sure there are permaculture projects around the world, but let's just say within 200 kilometers of you, there might be 30 permaculture efforts or something. If there were 300 or 3,000, then we have a proving ground and a crucible where people can compare and share and learn from the best practices, or is it inherently an individual thing without such networked information? I mean, you mentioned your book, I have it here, *RetroSuburbia*. I mean, this is an amazing bible. So this is a great way to get started. But is there knowledge that's being shared in a global network somehow on best practices?

David Holmgren (00:33:59):

Well, I would say that at a couple of different levels. Firstly, permaculture is a very loose globally networked affiliates. And there's people who are very familiar with my work and lots of other people who are actually working on the other side of the world, who may be actually individuals more familiar than the people down the street or in the next city. So we live in that networked world rather than geographic world, and that's part of those realities. But we also see places where there's a cluster of geographic concentration where people can share a lot more of the patterns because those patterns that are more unique to landscape climate culture are actually more immediately relevant rather than just relevant at the more inspirational scale or need to be more widely adapted. But the other thing I would say note is that permaculture has also been part of a positive agent of influence through a lot of things that are not branded permaculture.

(00:35:23):

So in Central Victoria, in the region where we are, we see a lot of the collaborations and a lot of what's happening doesn't necessarily have a permaculture label on it. And that is both a weakness that there's sometimes not the acknowledgement of the power of its influence through a lot of more mainstream movements. But it's also where things don't carry the baggage that it comes with a label and a classification and the

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bad stories or the skeletons in the cupboard or the project that someone saw that didn't work or that nasty person. All of those dynamics that work against something which is branded or classified in a certain way. Let alone all the cultural and cultural wars or all those are those people or these people.

(00:36:31):

So I think that's part of the complex dynamics of how those cells of replication and experimentation work. And I wouldn't say in this region, we're a long way down that track, but I think there are a lot. And certainly, in terms of my book, there's a limited number of case studies in the book, but there's a whole lot more case studies on the RetroSuburbia website. And some of those have also that research element of people measuring their produce. So you're getting data back of, "Okay. How productive are some of these garden systems or other elements?"

Nate Hagens (00:37:27):

So I was very impressed by that book, and I never read the whole thing because it's just really a compendium. But my take was one of the core messages in that book is given we have this existing infrastructure, how might it be repurposed to deal with limits and radically localized? There was menus of how to do this. Would something like this be applicable pretty much anywhere in the world where people are watching this podcast? Or are there some cities or regions that are too big with poor climate or soils that would simply need to be abandoned? Or is this can be applied everywhere?

David Holmgren (00:38:11):

Well, firstly, being our own publisher, the book breaks the rules of making it as widely applicable as possible by being unashamedly local in its examples. But in saying that, we see that firstly, that suburban template of separate houses on separate lots is a hugely common pattern, especially in the Anglo-American world, but more widely in the affluent world and increasingly exported to all places around the world. So that basic pattern of suburbia and the potential for RetroSuburbia of organic small-scale adaption of that is I think a very important pattern. And it's also a pattern in countries like the United States and Australia where most children are raised. And that's really important because that's actually creating the next generation who will osmotically learn potentially from their living environment adapting to having more

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adaptive skills to the world we're facing. So in that sense, RetroSuburbia is very widely applicable, even if some of the details need to be adapted to obviously different climates.

(00:39:50):

And I think the issue of higher density cities and cities in extremely difficult environments that, for example, extreme deserts being fed by fossil or unsustainable water use from elsewhere. Clearly, there's this problem of we've created cities in places that never supported many people in the past. I mean, as a nation, you would say Saudi Arabia is at maybe the extremity of that where they were just wandering better when peoples and small settlements on the fringes of now a hugely powerful and populous country. And you say, "Well, are those places in the long-term that you can support a city?" And the other one is the super high-density. And although, there's a lot of permaculture and kindred ideas for adaption of high-density cities, they involve a lot more stakeholders, much more technical complexity, and a lot more difficult issues than lower density cities. And they also may not be over the long-term, really workable at the population densities that are currently there. And the extremity of that would be somewhere like Hong Kong, obviously.

Nate Hagens (00:41:26):

Well, like you said before, you were explaining resilience and cities like Hong Kong and other big cities are very efficient at providing human needs and preventing the takeover of natural systems. But they're also an incredible drain on resources from the surrounding areas and really disconnected from nature. So it's this again, this trade-off between efficiency and resiliency. So instead of debating what's going to happen in the next five or 10 years because we don't know, what is the answer or what can you speculate on 50 to 100 years from now when we're clearly past peak fossil fuels peak growth? What future city habitation structure might be fittable for those humans?

David Holmgren (00:42:25):

Well, I think firstly, the possibilities of a hugely productive salvage economy where we take the infrastructure, the tools, the buildings of the huge discretionary economy that's being created, which will actually have no real function. There won't be a way to drive that. So what are all those buildings going to be used for? What are all those

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pumps and spa baths that could be wicking beds, or something retrofitted to aquaponic systems rather than saying, "Oh, we're going to do build all these high-tech systems to provide perishable food where people live using new manufactured materials," which I'm very skeptical about the embodied energy and complexity issues in that. But if we're salvaging what already exists, there's enormous opportunities that our ancestors never had. And then if we project that deep time forward into deep energy descent, something like stainless steel, our descendants will always have stainless steel to make high-quality knives just because of the stainless steel that we've created, which doesn't go away, is lying around. So this opportunity-

Nate Hagens (00:43:55):

And it could be reformed with an anvil and heat or something?

David Holmgren (00:44:02):

Yes. But that we shouldn't see, "Okay, what is the final technology that might be perpetually sustainable?" We need to see how there's this opportunistic reuse and accept that maybe that will be workable, but maybe people will just simplify again into the future and progressively cast-off things of saying, "No, let's do it a simpler way, or let's not do that function." It's actually not worth doing. So the discretionary economy itself is a whole lot of things that are actually really not even beneficial to people in any deep innocence in the same way that a huge amount of work is what's technically called bullshit jobs. Where even the people doing them, regard them as useless to society. So I think that's one of the most creative, positive aspects of this reconfiguration that people often don't see.

(00:45:08):

Now, I know there's a huge number of really serious problems. But the other one I would see is the positive opportunities that come from novel ecosystems, this hybridization of biology that's happened from mixing species from all around the world and high fertility along with polluted environments. Because sometimes those are almost the same thing that's creating these powerful novel ecosystems that most people call weeds or that are actually creating new resources and rehabilitating land. So that's been part in my work, part of the very positive thing of looking at those things that other environmentalists have seen as just signs of dysfunction in nature.

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We are now getting support from strong ecological research in that area that says, "Well, these are really important to study because there's going to be a lot of these ecosystems." And that ecosystem evolution, unlike perhaps species evolution, is remarkably fast. So a lot of ecological functionality is coming out of these new hybrids that actually offer possibilities that are potentially more productive than what existed in the past, rather than just going back to what existed in the past.

Nate Hagens (00:46:42):

But most people call them weeds?

David Holmgren (00:46:45):

For example, the issue of exotic vigor where something has taken from one environment and actually grows better in a new environment was one of the things that came out of European colonization and happened at the same time as fossil fuels. And if it hadn't been for fossil fuels, this novel productivity would have been the biggest single thing to increase human carrying capacity on the planet. Now, we can see the arrival of things like corn and potatoes into Europe, let alone Africa from the Americas. But also, species of trees like the Australian Eucalypt, which is the basis of all the energy supply in places like Ethiopia. The shift of Northern Hemisphere conifers to Southern Australia, and then, okay, what industrial agriculture and forestry have done, have taken those. And through the monoculture of mind focused on just one species and created monocultures, which have had all their apparent disasters.

(00:47:56):

But those downsides don't take away from this fundamental jump in biological productivity. And that when nature actually then hybridizes that into new ecosystems with remarkable speed, even when we don't even help or we're hindering, we see all of this increase in biological productivity and function. So for example, in Southern Australia, we have low fertility oligotrophic systems adapted to infertility. But now, with phosphorus in the environment from phosphate fertilizer, the whole continent is cranking up to a higher level of fertility. That shows up in our stream courses. Those have been cleared of native vegetation and now being colonized by many trees from the Northern Hemisphere, the dominant one being willows. Well, we now have the science on how much systemic productivity stabilization that's actually happening from

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that and gearing up the environment to actually work as a high fertility environment. And nature doesn't let fertility easily go away once she's grabbed it. So we're dealing with these changes in environment that we have been documenting and also managing in our own backyard. And so, there's these great opportunities there that we see in that regard.

Nate Hagens (00:49:36):

Let me ask a tangential question to that. Tomorrow morning, I have a round table discussion with Andrew Millison and Vandana Shiva and a few others, talking about how much food could we grow with modern technology and more human labor without fossil fuel inputs, without pesticides, without fertilizers, without herbicides, or with de minimis, like much, much less. And you talk about biological productivity and fertility. So we can indicate roughly that there's 700% of the mammalian biomass on the planet than there was 10,000 years ago. We have seven times more humans, livestock, and wild animals, and that is a product of the carbon pulse. But we also have a lot more human ingenuity and technology and able to change our environment. So what is your answer to how much food could we grow with permaculture with the skills that you know and others in the permaculture network are learning without much or any fossil inputs?

David Holmgren (00:50:51):

Yeah. This is a very difficult question, and I think there's the timescale of the depletion of that salvage economy, the reuse or embedding of what's already happened. So for example, the phosphate rock that's been mined, which is now in the biological system originally from phosphate fertilizer, but also in sewage effluent and whatever is like powering up the earth's terrestrial systems to degrees. In the same way that depletion of nutrients in other places is actually degrading them. So that heritage, because of the nature of phosphate and the soil chemistry and the biological relations to it, isn't easily going to go away over fairly substantial timescales. So that is a heritage of the fossil fuel era, and it's a once off because those

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concentrated sources of phosphate are limited, and the nitrogen pulse from the Haber-Bosch process that's created almost half the protein in the human biomass

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that's living today is a more fickle thing that can come and go. And that's why in permaculture, there's a lot of focus on nitrogen fixation via natural forms. And that aspect of novel ecosystems, exotic species powered by the phosphate to increase natural nitrogen fixation over pre-industrial levels are real possibilities. But how they work in the complex cultural knowledge base, those other factors are much more potent. And how we solve the conflict between the tribes, how much resources is going into military destruction and waste, those issues, I think are the more potent ones. And even if we look at the issue of more people involved in agriculture, we only have a history of taking people out of self-learned peasant farming and bringing them into urbanization and modern education. We don't have a recipe for, as Sharon Astyk said in her book, "In a nation of farmers, the United States needs 50 million new farmers." Most of them garden farmers, but the process of how we get those people, how they learn, that's a societal project that has never been done before. And can we do it in ways that are different from Pol Pot trying to send the urban middle class back to the farms, to take the extreme?

Nate Hagens (00:54:11):

This is the question, because most of those people have jobs right now that are paying quite a bit on the backs of the carbon pulse and the complexity. And they're not going to voluntarily do very hard work except a few people that want to permaculture first and beat the rush. Maybe those people act as pilots and people like, "I want to live like them," but I don't think, nor do I expect you do that we're going to create 50 million farmers before we have to.

David Holmgren (00:54:45):

No. This is the realities we have to deal with.

Nate Hagens (00:54:53):

So let me understand what you were saying before. I didn't understand what you were implying about the phosphate or phosphorus pulse. So I understand the carbon pulse and the nitrogen pulse, and you said that there's an abundance now of phosphate, which we have brought up from rocks and the ground, and grounded up and put it in our NPK supplements for conventional agriculture. And it goes into the soil and then

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into the rivers, and it's everywhere, but it's no longer concentrated, it's diffused. So what do you mean by that? It can continually be used by humans?

David Holmgren (00:55:30):

Well, firstly, because phosphorus tends to be bound in soil very quickly on iron and aluminum phosphate, which is virtually unavailable to plants, but microbes can use their biological jackhammers to get it back and make it available. So there's many soils, ironically in the affluent world that have been over fertilized with phosphate that is locked up, but it's in the soil. So that makes it very different from nitrogen in that sense. There's this huge amount.

Nate Hagens (00:56:06):

So we've built a phosphorus bank account in the soil, which is a good thing, but we have lots of bad things that are combined with it. Is that a way-

David Holmgren (00:56:15):

Yeah.

Nate Hagens (00:56:15):

... to say it?

David Holmgren (00:56:16):

And then the leaching... Well firstly, some of that then expresses itself in gigantic blooms of grass and plant pollen, and that is supporting insect life and other structures. But we've also got the very obvious one of blue-green algal blooms in rivers based on phosphorus into those rivers coming directly from fertilizer, coming directly from some of those biological products, and of course from human effluent and livestock effluence, and urban dogs and cat manure, all of those things going into waterways which are over fertilizing, destabilizing those systems. So we do have a lot of rapid movement of phosphate into the oceanic systems and some of that damaging those, and also going into deep geological recycling down to the ocean floor and waiting for the tectonic cycle to recycle all of that. So all of those processes are happening, but it's also important to understand that phosphate is the driver of

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nitrogen fixation. That without phosphate, the microbes, whether they're on legumes or other things, generally can't do much in the way of nitrogen fixation. So that is sort of part of that powering up what's happening.

Nate Hagens (00:57:55):

So the soils around the world are much depleted relative to 200 years ago. The topsoil where I live used to be seven feet deep and now it's 18 inches or something like that. But what you're saying is that the soil has an abundance of phosphorus relative to a couple hundred years ago, and that gives us opportunities in the future for things like permaculture and legumes, and things that might be grown without fossil fuels. They have that built-in helper in the soil, is that what you're saying?

David Holmgren (00:58:33):

Yes. And some of these things don't necessarily translate and show unlimited magic. For example, a new film, Planet Soil, which is a fantastic education on the biology and life of soil. One of the examples in that, they're all examples in the Netherlands of organic and regenerative farming. And one of them is actually a place which is a food forest, and they're saying this doesn't actually receive any fertilizer at all, but it's actually surrounded by a landscape which is intensively farmed landscape. And of course, all the birds that are feeding off that are coming into that food forest system and transferring nutrients into it. So that's an example also of more direct scavenging or parasitism off what's actually happening in the environment and helping to stabilize that and gain productivity from it. But you can say, "Oh, well, if it was all a food forest, that doesn't happen." Similarly, you can see systems of swale systems in deserts that have been promoted as great examples of permaculture, which are actually harvesting all the water off barren desert into a swale. But if you put those swales all across that landscape, you can't support quite the productivity you can. So I don't want to portray that position that, yeah, these things are some sort of magic, but understanding they are our opportunities and results from, if you like, the disasters of what we've done to the environment that are actually part of the way of regeneration.

Nate Hagens (01:00:21):

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So while you're speaking, I'm hearing some birds in the background. Were any of those kookaburras?

David Holmgren (01:00:27):

I didn't hear any kookaburras, but they are around here. There's a huge bird life at the moment in this box-ironbark ecosystem that's around this property where I am in this passive solar greenhouse that our son has built on his property where he's involved in the beginnings of biomass research, wood gasification from sustainable management of the forest. Actually focusing on the transport end of things of hybrid wood gas electric trucks. That is part of our small contribution using permaculture thinking to some of the things, not so much in the food sector, but relates to what this landscape actually generates spontaneously, which is wood.

Nate Hagens (01:01:28):

So here's a naive and difficult question, I imagine. So permaculture, as you've said, is a system of design and it's for designing a system, a permanent cultured food regenerative resilient system on your land. Could the designing of the system, could the principles that are in permaculture be applied to design a future system for Australia or the United States, or is it only on the local small level?

David Holmgren (01:02:12):

In principle, yes. The principles of permaculture definitely are useful for trying to understand and inform the possibility of policies, but I also give the balance to that. In a recent essay I wrote, dictated Dave's national water policy where back of the envelope calculations I did saving 40% of Australia's impounded water with the water crisis that we face in this continent from some basic land use changes. But I acknowledge in that, if that was to actually be put into practice rapidly, the known and the unknown economic, psychosocial and including ecological disruptions that would come from that rapid top-down implementation would in themselves make it not simple. So I think that's just really important to understand that even the best thinking when we sort of push it into nudging or pushing a complex system into a different state that's evolved in a particular way, the inevitable chaos that results is not what you intended. And so if I'm acknowledging that with what I think is some of the best

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ecological holistic thinking, I think that's what we're getting from the various power agencies and power structures trying to do things, even to nudge our energy system into running on renewables. As I'm sure you would agree, the two most complex things that humans have created are the internet and the power grid, and neither of them was designed from scratch, they evolved.

(01:04:21):

So you have to start with simple systems and build the complexity from those. But the usefulness of permaculture design principles and ethics of are these useful for people working at all scales? I think they definitely are to inform in some way whatever is being done.

Nate Hagens (01:04:55):

So I have lots more questions, and it looks like we're going to run out of time for me to ask all of them, but let me keep going here. Time is money is a popular phrase in our modern, technologically heavy, fast-paced modern and industrial society. How does time work differently in permaculture systems?

David Holmgren (01:05:21):

Well, we have the principle of small and slow solutions, which is a direct counter to the big and fast as the prevailing way of the fossil fuel world. And although that's not an absolute, it's a mental counterbalance to that. And we have many examples where we can see taking the time for something is actually a better pathway. In practical terms, many people have had the experience of putting seedlings from the Super Mart in the garden and them collapsing because they haven't been hardened off, their growth hasn't been slowed down. That most woodworkers know that good quality timber comes from slower grown trees rather than very rapidly grown trees. We know that the rapid force-feeding of livestock leads to diseases and short life expectancy compared with the more slower development. And we know in human design processes, especially the late Dan Palmer's living design process, that when we do things in small incremental ways, the creative, adaptive process rather than very fast processes.

(01:06:46):

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Now some of that can be seen as extreme, but we can apply that at more modest scales too. Right on this property here there's just been some earthworks done for the infrastructure for this biomass research, and it's been done with an old five ton excavator. Now, it was actually a job for a 20 ton excavator, which would've done it very fast, but the smaller machine operated by the person who is actually creatively designing all that is making adjustments, dealing with hard reef rock that can't be broken. Where do we put those materials that are coming out? Actually improving the design by working more slowly and in a process that is more like the way nature actually designs things. So that taking that time is actually really important in many ways.

Nate Hagens (01:07:45):

So taking the time, doing things slower and smaller benefits the emergence and the creativity of the land and the permaculture. But it also, well, I'll ask you, does it also help the mindset of the human, instead of the constant dopamine ratchet effect growing higher, to do things slower on your land also improves your mental health and resilience, and fortitude? Yes?

David Holmgren (01:08:25):

Exactly. And this is this very important aspect of these ideas that we've talked about in rational energetics. These are actually returning to what it means to be human, what it means to be connected to nature, connected to people, connected to community at human scale where human agency means something rather than just being a processor for massive resource inputs driven by imaginary indicators like money and the drivers of debt. So it's the same with this issue of is it more efficient to pack people into a higher efficiency city and they become embedded deeper and deeper into the machine, or is our inherent nature as being part of nature? So obviously we have a very strong, if you like, philosophical, but it's also psychological view and supported by so much science that that is what our true nature is.

(01:09:37):

And this is also the rediscovery of the ancestral wisdom of our forebears, which is also part of permaculture of saying, "Okay, people have had this wisdom before. What can we learn from that?" So we are not just trying to create something absolutely anew, at

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least being informed by our ancestors and the reconnection. Which is, a lot of people have observed that permaculture owes a lot to indigenous and traditional cultures of place, rather than it just being a construction out of ecological and system science, some of the great achievements of the modern world. So I think those reasons, those psychological and wellbeing reasons are actually often the primary drivers and sometimes the first most important benefits that come from this process.

Nate Hagens (01:10:40):

Except when you write a 500-page book on permaculture that keeps you from probably doing the permaculture yourself. I say that as someone that's podcasting about living differently, but I'm so busy that I'm not really living differently.

David Holmgren (01:10:56):

Yes, well, in my life, what I've done is always a balance between that external work in the world and having my hands in the soil, so to speak, or being the greenie with the chainsaw or all of those things. And that has been a benefit for me at two levels at the expense of maximizing power of apparent global influence, is that I've chosen to do that. To the state that I turned down an invitation to come to, I think it was one of the early Bioneers conference in the United States because I couldn't see that I could be there for three or four months, and that was my minimum to justify going that far. But it's also been by living that, I think the quality of what you then present in what you do is, has that, as the Maori would say, that manner, that potency, this is actually real stuff, rather than just, okay, how do we imagine what needs to happen?

(01:12:15):

And of course the system is always dangling the incentives too, "You can be more influential and powerful if you maximize that." And I saw that with David Suzuki when he was at his peak of going from one hotel to another and being from the airport in a helicopter to the event that we organized in Central Victoria. And I really respect all of that work that people have done, but maybe I'm a wimp. I know that I couldn't live in that way with that. I've got to have my hands on and the connection into ordinary things. And also just be an ordinary person, not amongst when you're doing things, now you're just the person from down the street rather than always at that level.

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Nate Hagens (01:13:14):

I love that answer. And I hope I'm never in a position where I have to take helicopters between meetings, but I'm doing one or two trips a year and that's it. And I'm trying to influence things from this small vantage point. So let me ask you this. One of the popular or common themes on this podcast is... Someone just logged me out of this, hold on just a second. I will have to edit this. I wonder what happened there.

(01:13:53):

So one of the common themes on this podcast is that we have six continent supply chains, they're fragile. We've got geopolitics and complexity, and financial overshoot, and energy depletion. And that one of the obvious implications of this in the coming decade is we're going to have to shorten and simplify, and strengthen our six continent supply chain. In your opinion, doing the work that you have for such a long time, what might this actually look like? And if helpful, using your nation of Australia as example, what would simplifying and shortening our supply chains and having a larger percentage of our population do some sort of permaculture, both for their own mental resilience and to be more resilient and regenerative with the land?

David Holmgren (01:14:56):

Now to some extent I make a distinction between what I'm sort of committed to and what permaculture generally is involved with and my future scenarios work of looking at what is realistically the context in which we will find ourselves working. Because I think there's that distinction between the what we might like or want, or try and manifest in the world, but also being realistic about what's coming over the horizon. And I see the real localization is happening through things like the re-establishment of national critical materials, resources where globalization is actually starting to go into reverse, and nation states are going, "Oh, we need to secure these basic things." So in my future scenarios work, I suggested that all of the scenarios involved a re-localization. But ironically, in the Brown Tech scenario, which I've said we are well and truly into largely in a world context now, it's localization from global decision-making to the reemergence of strong nation states taking control of their own resources.

(01:16:19):

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And so that's actually for ordinary people, that's an increase in power from above, it's just actually a bit more localized. So we shift into a command economy where the government says, "This is what we're going to do with these resources," where we've been in a world where whoever holds up the most US dollars gets the resources. So we saw the beginnings of that with the rise of Putin and Chávez in Russia and Venezuela at the turn of the millennium, and this resource nationalism. Australia is a huge natural resource producer, very rich relative to our populations, perhaps the richest in the world. In Odom's energy analysis we're twice as rich as the United States per head of population. And so, more valued processing of those resources like lithium and all of those things, I expect more of that to happen here that are not really to do with permaculture so much. But recognizing that that is the context in which we are likely to be working, in the same way that we see all of the modeling on climate change suggests of the OECD countries, Australia is the most vulnerable to extreme climate change. So that was the essence of my Brown Tech scenario, especially for Australia, is emerging. And so-

(01:18:03):

Yeah, is emerging. And so that is a very different form of re-localization. And what I've suggested in that process is you get a hardening and armoring of the system where there's two different incentives. One is to bring people into the system and protect them, and they remain consumers and producers within it. And the other is to push people out and go and look after yourself. Forget social welfare, go and look after yourself, go and be self-reliant in the country, whatever. But this is a tension in the system. So people doing things at the fringe will find, they'll actually have these choices where you're either in the system or you're out of it instead of a sensible ability to take the best of both. So for example, a classic one in self-reliance is greater home birth and people taking responsibility for birth at home. But having access to the centralized system as a backup.

(01:19:09):

Increasingly in the world we're facing, unfortunately, you end up with a choice. You're either on your own at the fringes with the informal unsupported or even illegal midwife, or you are in the centralized system and totally have to accept what it gives. And as it's armored and becomes more armored, the choice is actually narrow. So

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there's a security, but a straight jacket. And that sort of pattern is actually a dynamic which is relating to a form of re-localization where different things start to happen in different parts of the world. And it also reflects the geopolitical shift from the rules-based international order, which our nations are trying to maintain, and the multipolar world that China, India, Russia are articulating, which actually means the sovereignty of nations to do actually different things.

(01:20:24):

Now, whether that morphs into another form of a globalized empire, my energy analysis suggests it's unlikely to actually get to that and this thing where different things happen in different places and they're both good and bad. So that that's trying to show people this dynamic of how those things might work. And I think the COVID and its discontents can be understood as both perhaps a last effort of this global coordinated response. And it can also be understood in terms of, oh, this is what a command economy looks like, where the government goes, "Oh shit, we're the government. We've got to decide what happens." And so we can see that the climate emergency may actually involve those sorts of strategies where the government just says, "This is going to happen. You are going to get fuel here. You can't. It's going to be conserved for this." And that adaption to that, it's not around what's right or what's wrong, of understanding those dynamics of how different forces start to come.

(01:21:52):

Now, the sort of things we're suggesting obviously have even RetroSuburbia, actually involves a rapid growth in the household and community non-monetary economies. And that is actually subversive to GDP. So what we have to accept, that some of the strategies we're pursuing, while they're cool and friendly to people, they're actually very, very subversive to established interests. And how we make that dance of this is actually a good thing, it's small scale, but understanding that it's actually a threat to all sorts of established interests. And people have sometimes said that permaculture is revolution disguised as gardening.

(01:22:46):

So I just exist with that ambiguity of those things while a lot of permaculture people actually are strongly committed to the continuing common sense of, we can have things from the bottom up and things from the top down and they can work together.

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And a lot of people involved in permaculture are working at both those levels. But I say we need to keep those communications going, but understanding this rift, this structural separation, which it doesn't matter whether you attribute it to sort of evil people at the top or just the self-organizing nature of systems, it's the world I think we have to deal with.

Nate Hagens (01:23:36):

So for people that are starting to get their arms around this, which is many people watching this program, two-part question, what advice do you have at this time of global upheaval, anxiety, limits, climate, energy, geopolitics, just general advice to listeners? And the second part would be if they want to take some steps towards starting or advancing permaculture where they live, would it be the same advice you would give? Two-part question.

David Holmgren (01:24:16):

Yeah. Well, I think that one of the first things is if permaculture seems to make sense for people to become more deeply embedded in the lens of thinking about it in terms of ethics and principles and look around and see things that you can see, oh, those things are reflecting that whether or not they have any label or even if they actually look, the social demeanor of those things seems wrong. So for example, I've said, you don't need to even believe in climate change to see a lot of the common sense of RetroSuburbia. So to see those things around, especially in your own geographic community, to step outside of one's network and increasingly network online community, not to remove oneself from that, but to look at what exists down the street in the neighborhood and make those connections to people around common understandings. And that may be exchanging of things, working, extending that trust in the community, non-monetary economies.

(01:25:46):

So building all of those possibilities, I think especially across the cultural and value divides that appear to be really dividing people is perhaps the most important thing. Within families, within households, that's really, really important. So also using permaculture, and some of the tools that were provided with RetroSuburbia of the more household order, what's our strengths, weaknesses, and threats, looking at that in

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a holistic, not fear-driven version of what people might see as prepping. And look at, okay, what are our opportunities to structurally change that to create new households? And a lot of that we see as the reemergence of extended family households, but also the strength in the household economy.

(01:26:52):

So I see lots of opportunities for that, and I think those things can open up a lot of possibilities that are obviously very different and diverse in different places. So it's hard to be specific obviously about those, and people becoming connected to their sources of sustenance, the farmers that supply their food, or if that's not possible because of that centralized system, well, what are the people you need to be connected to? And not everyone needs to be a farmer, but also saying, do you have a skill which is directly useful to other people rather than putting your card in the slot in some corporate or government system and producing some income, which then allows that? And it may be being a bicycle or a car mechanic. It may be complimentary health related things, but things that are directly useful to another person. So I see that as really important opportunities to become a more useful, helpful person, and that is how we rebuild support bases and deal with difficult and uncertain times.

Nate Hagens (01:28:40):

We don't have a lot of young people watching this show, but there are some. How would you change your advice to young humans who become aware of the human predicaments who are in their late teens or early twenties? What advice do you give to those people?

David Holmgren (01:28:58):

Well, although RetroSuburbia was very much focused on people who are sort of concentrating on permanent households, often raising children, one of the templates is what we call mobile minimalism. And for a lot of young people trying to avoid debt or minimize further debt, maintaining flexibility and building one's skill base through voluntary action. People used to say to me when I was young, "How did you learn all this stuff?"

(01:29:30):

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I said, "I used other people's land, other people's resources." Obviously I had to have something to offer to be able to do that, but I didn't have, "Oh, I've got to own it." Because what I used to say is, "What I take away in my head, what is inside me, no one can take that from me." And that's actually more valuable than whatever asset or improvement I leave behind. So this synergy that we need between older people who've been on this pathway to some degree and own property, own assets and are aging, and young people who have energy, want to do things, want to learn. There's this huge complementarity between those. But both groups have huge psychosocial impediments to giving up some of the things they're holding onto. And it applies on both sides, the people of my generation and young people. But we see some of those things are also learning places for a lot of people, especially at teenage, to go out and have that experience in the real world.

(01:30:51):

And sometimes that leads to, "Oh, the old folks aren't so bad, I can actually navigate with them this new path," which is even sometimes the better learning that comes from those sort of relationships. But sometimes it's finding other mentors and people that you can work with, whereas the baggage of family and upbringing can often be too difficult to expect to navigate, at least in the current context. And trying to do that in ways that remain geographically connected to the people you might be one day supporting. So trying to ease back from these globalized relationships across the world, which is a lot of pain and suffering of people who will be disconnected from each other, which is really one of those tragedies.

Nate Hagens (01:31:54):

It's not something we often think about. We take it for granted. I mean, look at this, I'm talking to someone in Australia and recording it and hearing the sounds from your son's farm, et cetera. It's something we take for granted. So David, what do you care most about in the world? A question I ask all my guests.

David Holmgren (01:32:21):

Yeah, I suppose the potential for people to see and experience the abundance of nature, that nature still works and it is not a sort of a nothing thing. And it can be something that sustains us and fulfills us even if it's hard work and challenging. And

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we have to accept that we are not as in control as we expected to be. So I think that that energized acceptance of reality and how we keep that balance between doing things and yet being realistic about what we can do and what we can't do, what can be controlled and what can't be. And from whatever sources those things come from and what we attribute them to, the weather, natural energetic resource limits, or evil cabals in the world, or God punishing us for our past sins, that there are things we just need to accept and work with. And of course people aging, for all of us aging, that is a process that all of our ancestors have had to deal with anyway, because it's part of what happens of that letting go process as well.

Nate Hagens (01:34:06):

If you could wave a magic wand and there was no personal recourse to your dissident personality, what is one thing you would do to improve the future for humanity and the biosphere, hypothetical?

David Holmgren (01:34:23):

I find that question really difficult. And I suppose my essay about Dictator Dave's national water plan indicates that. But I suppose I used to think that sustained high energy costs would actually be the most useful, benign way to stimulate positive change and adaption. But as we get to late stage thinking and late stage of response, I am more and more humble about any magic wands and the collateral damage that comes from all of them anyway. So I have a sort of a big psychological resistance to that because every possible thing I would put forward, the other part of me can ruthlessly show why that won't work.

Nate Hagens (01:35:41):

Yeah, well, I mean, you're not a fanatic, you're humble. And I think unfortunately, I think hubris of people knowing exactly what to do is one of the real risks and frailties of our species and our culture. So I appreciate your humility and uncertainty on that. So David, as a co-founder of the concept of permaculture, do you have any closing words for our viewers?

David Holmgren (01:36:12):

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Well, I think it is extraordinary to live in these times. And I think the stories that people will tell their grandchildren or other young people about this time is extraordinary. And of course there is that the saying about the curse of living in interesting times. I think it is also how to feel special and not making judgements so much about the good and the bad. And for me, that's been a lifetime thing of living on this pulse of fossil fuel, of experiencing that, and then being able to move forward beyond that is those huge opportunities and the huge privileges we have of living at this time where each one of us actually has the potential to influence the future. Like we are standing on a mountaintop and we go round that rock, heading down for a pathway to safety and we go round that rock and we end up in a completely different valley to if we'd gone round the rock the other way.

(01:37:43):

And so that pivotal time in history where remarkably small changes, even though we feel powerless in the scale of things, can result in enormous consequences. And that is a creative opportunity. And as my partner Sue says about raising children and the whole crisis joy of being parents, remember, whatever you do, it'll probably be wrong. So just do the best you can, which may seem a very negative thing, but it's again, part of this acceptance of where we live in that extraordinary time and to not treat it as mundane and as without possibilities.

Nate Hagens (01:38:44):

Thank you for your time today and thank you for your seminal work over the last 50 years. You've changed how many people around the world view their land and permaculture. And to be continued, sir, if I get to Australia someday for a couple of months, I will look you up.

David Holmgren (01:39:03):

It'd be very good to ... Connected in that way. Thank you. And thank you for your podcast. I was telling my son's partner, who's a small scale organic dairy farmer, I was going to be doing this, and she said, "Oh, that's one of two podcasts that I listen to." And we swapped between all those old males on there talking about really interesting things, and this other one that we do about farming, which is mostly girls and mostly

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local and very grounded in the practical, and they're both complimentary. So that was her comments on ...

Nate Hagens (01:39:49):

That's a great comment. Give her my regards. And we need both. I think we need both. Thank you so much, David. If you enjoyed or learned from this episode of The Great Simplification, please subscribe to us on your favorite podcast platform and visit [thegreatsimplification.com](http://thegreatsimplification.com) for more information on future releases.