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Resilience & Reciprocity; key permaculture concepts

By David Holmgren September 2009

Resilience; the new sustainability buzzword

Resilience is a technical term from systems theory and ecology that has come into the popular lexicon in recent years as a desirable characteristic for communities, economies and nations. **Resilience is the capacity of a system to recovery from a major stress.** It is a characteristic of ecosystems and sustainable low energy societies that are subject to both periodic and erratic stresses that impact and change the system but allow continuity of process and function. It has been taken up as a key concept of the Transition Towns movement that was founded by permaculture activist and teacher Rob Hopkins.

Resilience is "*the ability to absorb disturbances, to be changed and then to re-organise and still have the same identity (retain the same basic structure and ways of functioning). It includes the ability to learn from the disturbance. A resilient system is forgiving of external shocks. As resilience declines the magnitude of a shock from which it cannot recover gets smaller and smaller. Resilience shifts attention from purely growth and efficiency to needed recovery and flexibility. Growth and efficiency alone can often lead ecological systems, businesses and societies into fragile rigidities, exposing them to turbulent transformation. Learning, recovery and flexibility open eyes to novelty and new worlds of opportunity*".[1]

Resilience results from system design, not from just reactive response after stress. Resilient systems tend to be composed of diverse subsystems and elements that are loosely connected but exhibit a high degree of localized function, and autonomy. When one part of a resilient system is stressed or damaged, the other parts continue to function and where possible assist in repair and recovery. Sub systems and elements do not depend on a functioning "nerve centre" or command structure to continue to work.

In Permaculture: Principles and Pathways Beyond Sustainability, I discussed resilience and flexibility in the context of principle 12 Creatively Use and Respond to Change.[2] The focus by Rob Hopkins on resilience in the Transition movement confirmed in my own mind that resilience as a key concept for permaculture design and that it is intuitive in all my thinking and explanation of permaculture. If resilience is so fundamental, is it a permaculture design principle? I see it more as one of the "characteristic" properties that arise from the application of permaculture design principles. Each of the design principles contribute to resilience but I don't think of it as a design principle, mainly because it depends on virtually all the other principles.

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[1] Quote from the Resilience Alliance website, a major source on resilience in socio-ecological systems. http://www.resalliance.org/1.php

[2] to quote from PP&PBS, page 242 "The ways in which species, ecosystem and whole landscapes develop resilience to …larger destructive forces is a central issue in ecology and, by conscious design, in permaculture.

Also design principles (in my view) should be positive action statements that are concrete enough to be widely applied and to say Design for Resilience raises a question about how to do this. To some extent this might be asked about many of the 12 permaculture design principles but the answers to those questions are not primarily by applying the other design principles. I believe resilience can best be thought of as a dependent rather than independent characteristic of natural and enduring human systems.

To test that idea, what follows in my (very brief) summary of how each of the twelve design principles supports and enhance resilience? As well as showing the strengths (and any weaknesses) in my articulation of design principles to incorporate important concepts, this summary can also be used by others familiar with the framework to test their own awareness of the noted outcome of the principles. Doubt, should in any case stimulate a deeper feeling for how we should understand and articulate permaculture design principles.

P1. Observe and Interact
Constant awareness and interaction with the physical and social environment allowed traditional peoples to survive and thrive change, stress and threats. Constant awareness and interaction gives early warning of stresses and possible adaptive responses.

P2. Catch and Store Energy
Building capital assets gives the system the capacity to ride out shocks, drawing on its fat and repairing damage after the event. For example storage of water, food and other necessities reduce our vulnerable to interruptions and failures of supply chains.

P3. Obtain a Yield
The greater the degree of self reliance, the greater its autonomy from stresses that are outside our control. Self reliance at all scales within systems increases resilience even if this appears to reduce system efficiency. The culture of entrepreneurial behaviour associated with self employment and small business is an asset in reducing personal and societal vulnerability to crisis and change.

P4. Apply Self-regulation and Accept Feedback
Self regulation of consumption and growth keeps us fit and adapted avoiding dangerous dependencies and vulnerabilities to larger system negative feedbacks that limit dangerous dysfunction within the system. Climate change is the largest scale example of how climatic feedbacks will eventually limit human excesses if we don't restrain ourselves.

P5. Use and Value Renewable Resources and Services
Sustainable use of renewable resources and services reduces vulnerability to stresses from dependence on (and addiction to) depleting non renewable resources. Renewable resources tend to be widely distributed, reducing dependence on centralized systems and the potential for monopoly control.

P6. Produce No Waste
The proverb "Waste not want not" is about avoiding difficulty in hard times not just by providing resources saved from the good times but by creating a pattern of

behaviour where we are used to seeing opportunities to increase the efficiency and savings in all our activities.

P7. Design From Patterns To Details
Understanding the big picture helps us design systems that take into account of potential changes in the larger environmental forces and factors that shape every system. This approach helps to avoid design cul-de-sacs that have to be abandoned when conditions change.

P8. Integrate Rather Than Segregate
Integration between the elements of any systems develops complimentary exchange relationships that strengthen the whole system. If integration remains loose, preserving a degree of autonomy and redundancy, then the whole system will be much more resilient to external stress than rigid resistant systems with a high degree of specialisation that are strong but brittle.

P9. Use Small and Slow Solutions
Small scale systems are better able to fit in niches that are more secure and better protected from large scale and destructive outside forces. Small scale also can protect from internal disorder and stress that result from excessive complexity in larger systems. Slow growth allows for a better assessment of essential inputs and helps avoid the problem of overshoot and collapse from excessive growth.

P10. Use and Value Diversity
By not putting all the eggs in one basket, all systems are more able to survive and recover from change and stress that comes from outside or within the system. Diversity within and between systems provides insurance against unpredictable stress and change.

P11. Use Edges and Value the Marginal
Boundaries and membranes are the sense organs of systems providing early warning about external stresses. The marginal parts of any system can also provide back up resources that can be drawn on in times of dire need.

P12. Creatively Use and Respond to Change
Awareness that change is a constant in all systems at all scales prevents complacency and ignorance of both external and internal forces than can overwhelm the most apparently strong systems. Design that encourages system evolution and development maintains fitness and mobility to deal with changing conditions.

Reciprocity; ethic or design principle?

Another key concept that some[3] see is missing from the ethics and design principles framework is that of Reciprocity; the give and take than exists within nature and traditional communities. I recognize Reciprocity is a key concept relevant to permaculture design that I did not directly refer to in PP&PBS. Is it a permaculture

[3] Pointed out to me by NZ permaculture activist and teacher Brian Innes

design principle? Reciprocity can be primarily understood as an ethic (do unto others as you would have them do unto you). I see reciprocity as an expression of the ethic of *Fair Share* that arises from the awareness of both limits and abundance. This incorporates the notions of reciprocity beyond one's normal circle of community and applies to our relationships to the whole of nature as well as people everywhere. Some of the design principles incorporate stronger application of reciprocity than others. For example *P4 Apply Self Regulation and Accept Feedback* leads to designs that exercise restraint in the face of opportunity and receptivity to information about the state of the wider encompassing systems. *P8 Integrate Rather Than Segregate* builds on the idea that everything is connected, to create closer integration and mutualistic relationships within and between systems while *P9 Use Small and Slow Solutions* allows the space for other systems to thrive. If I was to place Reciprocity as a principle I would see it primarily being Principle 4 that might be restated ***Acknowledge reciprocity between all systems in time and space.*** Alternatively we could just say that Reciprocity, like Resilience it is more of a dependent system characteristic that emerges from application of each of the 12 design principles. The following is my draft of how I would test this proposition

P1. Observe and Interact
Observation develops empathetic appreciation of the observed while interaction makes clear that we are part of the system. Reflection and repetition of this cycle builds give and take relationships that are the very essence of reciprocity

P2. Catch and Store Energy
The process of catching and storing energy (capital accumulation) makes clear that the sources of wealth are outside our system. This accumulation of wealth provides the surplus that we can draw on in times of need, not only to support ourselves but to give back, as Odum said, to "lower order system providers" and pass on to "higher order system controllers"

P3. Obtain a Yield
By designing systems to be productive and self reliant we reduce the risk off excessive (addictive) dependence that poisons any capacity for reciprocity.

P4. Apply Self-regulation and Accept Feedback
Awareness of limits and the potential for negative feedback from larger encompassing systems of society and nature encourages self control to work within limits. This self restraining behaviour reflects a balance between self and the greater good that nourishes reciprocity.

P5. Use and Value Renewable Resources and Services
When we depend on renewable resources we are more likely to recognized limits to their exploitation and the need for husbandry in their maintenance. Renewable services especially those from working relationships with animals breeds empathetic relationships of exchange rather than exploitation

P6. Produce No Waste

The proverb “a stitch in time saves nine” reminds us that the function of maintenance (as a key way to avoid waste) is strongly connected to feminine energy that nurtures and repairs all the elements as essential parts of the whole.

P7. Design From Patterns To Details
The view from the mountain instills a respect and awe of the wider world and how everything is connected and interdependent.

P8. Integrate Rather Than Segregate
Integration of previously separate elements, individuals and groupings encourages fair trade (equitable and mutually beneficial exchange) that can reflect reciprocity rather than the aggression that goes with so called free trade.

P9. Use Small and Slow Solutions
Replication rather than overgrowth of successful systems accepts the mortality of all systems and the need to pass the baton of life on just as one has received it from forebears. Limits to growth also provides the space and resources for other systems

P10. Use and Value Diversity
Diversity between systems encourages trade rather than exploitative relationships and a sense of wonder with the novelty of the world. This in turn nurtures reciprocity rather than zenophobia in response to difference.

P11. Use Edges and Value the Marginal
Valuing of marginal, redundant and apparently unproductive and unattractive parts of systems breeds an awareness about how contributions to the greater good come in strange and surprising ways.

P12. Creatively Use and Respond to Change
Flexibility rather than rigidity contributes to survival and success but it also acts as a moderator of hubris and encourages reciprocal relationships that accept ones place in the larger scheme where we do not have complete control of our circumstances.

These exploratory thoughts on comments and critiques by other permaculture teachers of my framework for permaculture ethics and design principles might themselves show the “resilience” of the framework to be able to maintain utility in the face of a rapidly changing conceptual landscape. Hopefully this essay might also show “reciprocity” in being able to acknowledge input, contribution and change from many quarters.