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Theme: Transitions towards an ecological economy

### **Building Sustainable Communities on Ecological Principles**

#### **Abstract**

The limited life of biota provides an ecological principle for building a global society composed of self-financing, self-reliant, self-governing communities. Implementation requires communities to limit the life for owning realty, corporations and money. Limited life money and credit created by traders and investors becomes redeemable into units of local renewable energy. Ponzi banks and unearned income from money are eliminated. Incentives provided to attract alien enterprises and technology are matched with built-in ownership transfer back to stakeholders resident in the community to terminate draining away surplus profits. Urban land ownership is mutualised to form self-financing Land Banks to halve the cost of new housing and attract commercial investment. This minimises non-residents extracting windfall gains and surplus profits that can make communities financially dependent on higher orders of government. Centralised big government, taxes and banking are replaced with federations of bio-regional economies financing nation states that in turn finance global governance.

**Key words:** Ecological capitalism, Energy money, Network governance, Self-financing communities, Stakeholder society.

**JEL:** D31, D63, E42, G32, P16, R12

## Building Sustainable Communities on Ecological Principles

### 1. Introduction

This article explains how the design principles found in living things provides a basis for modern communities to become self-financing, self-reliant, self-governing building blocks for establishing a sustainable global society. As shown in Table 1, History and vision of a transforming society the changes required to achieve this objective are not as great as the changes that have already occurred over the last millennium.

**Table 1, History and vision of a transforming society**

	<b>Features</b>	<b>Past society</b>	<b>Present society</b>	<b>Future society</b>
1	People treated as	Property	Resource	Potential
2	Role of women	Breeding	Cheap labour	Full partners
3	Purpose of work	Sustenance	Income distribution	Fulfilment
4	Sources of income	Work	Work or welfare	Work, welfare, dividends
5	Environment	Subservient	Dominant	Stewardship
6	Natural resources	Use	Exploit	Sustain
7	Source of land acquisition	Conquest or inheritance	Purchase or inheritance	Use
8	Land ownership:	Through occupancy	Perpetual	Time of use & so limited
9	Firm ownership:	Start up or inheritance	Purchase/start up & inheritance	Start up, investment and stakeholder rights
10	Business owners:	Proprietors	Shareholders	Stakeholders
11	Ownership period	Life of owner	Perpetual	Limited
12	Property rights	Discretion of Sovereign	Static, monopoly and perpetual	Dynamic co-ownership and time limited
13	Structure of business	Paternal and centralised	Hierarchic and centralised	Nested networks of component holons
14	Monopolies	Granted to private interests by rulers	Banned or government control	Removed by time limited dynamic property rights
15	Institutions	Perpetual	Evolving	Dynamic
16	Basis of money	Commodities	Artificial	Services of nature
17	Creation of money	Decentralised in private sector	Government controlled	Decentralised competitive private sector non-banks
18	Cost of money	Storage & testing	Interest	Cost of risk insurance
19	Allocation of resources	Command & control	Markets	Family, benevolence, semiotics & markets
20	Value system	Absolute	Materialistic	Humanistic
21	Wealth distribution	Autarchic	Market forces	As to contribution & need
22	Accumulation of economic value	Limited by political power	Not limited	Limited by time, dynamic rights & demarchy <sup>a</sup>
23	Political power	Centralised in ruler	Gov. & big business	Spread to communities
24	Source of power	Inherited, physical	Democracy	Holonic with demarchy

<sup>a</sup>Burnheim (1985), Martin (2001)

One fundamental design principle of biota is limited life. Another requirement for biota to survive is to obtain feedback data from their environment to regulate their activities to sustain their existence as individuals and as specie. To adopt these design principles in a modern

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society the current static, unlimited life and exclusive rules for owning realty, firms and money would need to be replaced with ones that are dynamic, time limited and inclusive. One purpose of this article is to explain the nature of these ecological design rules and how they might be introduced.

The introduction of ecological ownership is necessary, but not sufficient. Also required is ecological control described as 'Network Governance' (Author 2002). Network governance is ubiquitous in nature (Ingber 1989, Mathews 1996, Smuts 1926). Such is the efficacy of network governance that it spontaneously emerges when society become more complex and dynamic (Jones, Hesterly and Borgatti 1997). The reason for its success is because 'Nothing can be made simpler without becoming more complex' as noted by Dee Hock (1995) the founding CEO of the network governed organisation – VISA International Inc. In other words, as society gets more complex its governance requires matching complexity in its communication and control circuits (Ashby 1968). The increase in organisational complexity allows tasks within the organisation to become sufficiently simplified to match the limited ability of humans to multi-task and/or process data (Author 2000b).

Task simplification also facilitates the appointment of some officials by lot, like a jury, from qualified individuals interested to serve. This practice used in ancient Athens is described by Burnheim (1985) as "demarchy". Demarchy removed the incentive for elected officials to promise more than they can deliver and/or buy votes. It also avoids powerful lobby groups using money, status and influence to have officials appointed of their choice.

Both evolution and analysis (Simon 1962) provide evidence that the communication and control architecture of nature creates the most robust way to create or manage complexity. Innate physical structures of nature and biota always create or manage complexity by using simpler sub-components. The universe is made up of components that Dee Hock describes as "Chaords" (Hock 1995) because they represent both chaos and order. The academic literature describes these components as "holons" (Koestler 1967) as the whole creates more than the constituent parts, a feature recognised by Smuts (1926) who used the term "wholism".

Another purpose of this paper is to describe how sustainable communities can be designed to become a basic building block for forming self-governing bio-regions and environmental national republics to further global governance. This structure is set out in Table 2, Global Governance and Political Economy. Each level listed in the left hand column of the paper represents a holon as it represents what Simon (1962) described as a "sub-assembly" or "stable intermediate forms" or "able to maintain a separate existence". Beer (1985) describes them as "viable systems" and Mathews (1996) as "endowed with its own processing ability, its own autonomy, its own mind or intelligence". Multiple numbers of holons in each level except the last are included in the next higher level. Such a hierarchy of holons is described by Koestler (1967) as a "holarchy".

Holarchies are ubiquitous in nature and have properties diametrically opposed to hierarchies. The differences are highlighted by Dee Hock (1995) who stated:

Industrial Age, hierarchical command and control pyramids of power, whether political, social, educational or commercial, were aberrations of the Industrial Age, antithetical to the human spirit, destructive of the biosphere and structurally contrary to the whole history and methods of physical and biological evolution. They were not only archaic and increasingly irrelevant, they were a public menace.

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**Table 2, Global Governance and Political Economy**

<b>Level</b>	<b>Principle role<sup>(a)</sup></b>	<b>Other roles<sup>(a)</sup></b>	<b>Source of funding<sup>(b)</sup></b>
Family	Personal and social development	Community and cultural development	Work and/or dividends, rents, profits etc.
Enterprises	Wealth generation	Fulfilling work	Self-financing
Neighbourhoods	Social & cultural support	Substitution of paid services	Non-profit & voluntary contributions
Land banks (CLBs)	Income distribution between entities	Health, education, welfare, & other infrastructure services	Enterprise rents & gains from site trades
Cities	Provide infrastructure	Balance income between CLBs	Taxes from CLBs
Bio-regions	Federating economic & political systems	Co-ordinating infrastructure services	Green taxes from degrading enterprises
Regional bio-spheres	Federating bio-regions	Co-ordinating economic structures in regional bio-spheres	Green taxes from bio-regions
Global	Governance of global commons	Co-ordinating political structures in regional bio-spheres	Green taxes from regional bio-spheres

<sup>(a)</sup>Roles allocated on the basis that no level of government should carry out any function, which is better undertaken at a lower level as per the ‘Principle of Subsidiary Function’ (Schumacher 1975: 203).

<sup>(b)</sup>Sources of funding based on the medieval cascade system of taxation where each level of government taxes the next lower level, which it represents. No taxes on individuals or the profits of enterprises. Redistribution of income achieved through the private sector from the democratic distribution of income producing assets and cross-subsidisation through land bank rentals, property trades and provision of welfare services.

To allow communities to be self-governing they must become self-financing to avoid economic and political dependency. The same principle applies to all the higher levels in the political hierarchy listed in Table 2. To allow communities to become self-financing they need to stop value leaking out. Many families spend over a third of their income on rents or mortgage payments. To stop rents and interest leaking out it becomes essential for communities to establish their own local currency and minimise any external ownership of land, buildings and enterprises. The establishment of local currencies and ecological rules for owning realty and firms provides a way to plug the drains that invisibly suck out economic value from communities.

The following section will describe the local creation of green dollars to minimise exporting interest payments. The third section describes Community Land Banks (CLBs) that provide a local government institutional structure to reduce economic values draining away to alien communities through the payment of rents and windfall gains in property ownership. The fourth section describes how ecological property rights can be used to attract more alien investment on the basis that over time it becomes locally owned and controlled. In this way the export of economic value through dividends, profit shares and royalties can be minimised.

### **2. Ecological community currencies**

The section describes why the design of existing money should not be replicated in a community currency and how green ecological dollars can be created.

Table 3, Existing and Ecological Money outlines how green dollars contribute to building an ecological economy with quite different operating characteristics. Local Employment and

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Exchange Trading Systems (LETs) allows any person in a community to create and/or obtain credit. There has never been a need since money was invented for either governments or banks to create credit as set out in Table 3, row 1. Anybody can create credit. Hand written IOUs were used as hand to hand money in Sydney Town early in the 19<sup>th</sup> century before there was a printing press or the discovery of precious metals in the Colony (Butlin 1953). Creditability to the notes was established by other parties also signing them. Today notes would need a creditable third party guarantor. The guarantee fee would create a carrying cost as noted in Table 3:2 and at 3:7.

A community currency is not just required to plug economic leaks but to also establish a local unit of value that is defined by the natural endowment of the host bioregion (3:6). In this way the local environment can provide self-correcting price signals (3:10; 3:12) to maintain its sustainability that get lost with a national monopoly currency (Jacobs 1985: 156). National currencies can create greater distortions in the allocation of resources than the introduction of substantial tariffs (Author 2008b).

**Table 3, Existing and Ecological Money**

	<b>Difference between:</b>	<b>Existing money</b>	<b>Ecological money</b>
1	Money created by:	Government & banks	Traders and investors
2	Interest rates fixed by:	Central Bank	Cost of risk insurance
3	Expansion of money:	Government ratios/regulation	Value of transactions
4	Money defined by:	Government fiat	Local resources of nature
5	Choice of currency	Government monopoly	Determined by community
6	Inflation control by:	'Blunt' policy instruments	Value of renewable energy
7	Structure of money:	Unlimited accrual of interest	Carrying cost limiting life
8	Economic flaw-1	Incentive to own money	Disincentive to hold money
9	Economic flaw-2	Allocates resources to finance	Real assets more attractive
10	Economic flaw-3	Distorts price relativities	Price related to sustainability
11	Environmental flaw-1	Incentive to burn carbon	Favours renewable energy
12	Environmental flaw-2	No feedback from nature	Nature controls price signals
13	Social flaw-1	Compounds unearned income	No unearned income
14	Social flaw -2	Concentrates influence	Localises influence
15	Political flaw-1	Concentrates power	Enriches local democracy

Over the millenniums money has always been a product of nature that incurred a storage and/or insurance cost (3:2; 3:7). Cost carrying money reduces the resources absorbed by the financial system because it removes the incentive to invest in synthetic paper assets (3:8) rather than in the real economy (3:9; 3:11). In this way cost carrying money paradoxically reduced the cost of the financial system whose purpose is to service the real economy.

Cost carrying money also improves equity as it removes the ability for money to make money from earning interest (3:13). Instead of capturing 'unearned income' (Gesell 1919) an incentive is created to invest in '...processes by which society expands its power to make nature yield its resource more abundantly' (Moulton 1935). In this way productivity is increased to reverse inflation while limiting the ability of the finance sector to act like a leech on the real economy.

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No living thing can exist without processing energy, so electricity generated from renewable resources provides a universal inflation resisting unit of value (3:6). The relative value of the Kilo Watt-Hours (kWh) generated in each community could vary according to its endowment of renewable resources. But some sort of renewable energy is available throughout the world. As noted in 3:8 the role of money would be simplified to only being a unit of account and medium of exchange and not also a store of value.

Green dollars can be generated by anyone who invests in solar cells, wind farms, hydrogen producing bacteria or other sources of renewable energy. Ideally, the unit of reference value of a community would be created by mutually owned renewable generators. The generators would be financed by consumers buying their electricity in advance by accepting IOUs issued by the mutual association (that they would then own) to deliver specified kWh at specified future times (Author 2008b). The IOUs would be negotiable to become the reserve green currency of the community. Ideally also, the local government body or Cooperative Land Bank (CLB) as described in the following section would require its rates to be paid in green dollars issued to finance the renewable generators. The local government body could then redeem its notes to pay for its street lighting and other energy requirements.

Locally created green money and credit provides a basis to minimize economic values being drained out communities through interest payments (Author 2008a). The mutualisation of urban land into CLBs designed with ecological property rights likewise stops the export of rents and windfall gains.

Privately issued cost carrying money described as ‘stamped scrip’ spontaneously and rapidly spread through Europe and the US during the Great Depression because it was so successful in stimulating local communities (Fisher 1933, *The Economist* 2009a). The scrip was issued mainly by individual businesses in Europe but in the US it was mainly by the local chambers of commerce. The merchants would give the scrip away to their customers. Each Tuesday night the notes became worthless unless the holder placed a stamp on the back equal to 2% of the notes’ nominated value. In this way the issuer sold stamps over a year valued at 52 by 2% being 104% to allow them to redeem the notes for official money and leave them with a 4% gross margin. While the merchants would need to pay 2% of the value of the notes they held on Tuesday evening, this is but a fraction of the cost of paying over 2% on every credit card transaction.

Today, stamp scrip could be created in electronic form that could be stored on the Subscriber Identity Module (SIM) cards of cell phones and on the computers of their internet service providers (Author 2009). In many developing countries without phone lines or banks cell phones are being used to transmit money with the local village store redeeming the credits into the local currency (*The Economist* 2009b). In some regions, cell phones can be swiped at check-out counters to make payments<sup>1</sup>.

Electronic natural money redeemable into locally generated kWh would provide a way for communities to insulate themselves from the global economic crisis. Green dollars create the means to build economic lifeboats to float away from the control and exploitation of big

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<sup>1</sup> As described at <http://www.nextbillion.net/remittances-mobile-globe-cash> and <http://wirelessfederation.com/news/zain-bahrain-launches-zain-wallet-bahrain/> viewed 5 May 2009.

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money centre banks. However, to build the most efficient, equitable and effective lifeboats, communities need to establish CLBs as described in the next section.

### **3. Self-financing urban communities**

This section describes how communities can efficiently restrict the leakage out of community economic value through rents, interest and/or capital gains. To achieve these objectives the title deed to land needs to be separated from the title deed to structures over the land (Author 2007).

Combing the ownership values created in land with the ownership values of buildings creates both inefficiency and inequities because the land values are created by parties providing essential services but who do not own the land. As a result land owners capture unearned windfall gains generated by the investment by others such as the government who finance the roads, water, sewerage, schools and hospitals and the private sector providing shopping facilities, places or work, amusement and recreation.

Efficiency and equity can be achieved by all buildings being privately owned with all sites on which they are built being owned mutually by all citizens residing in the community with a sufficiently large population to support a number of secondary schools and places of significant employment. In this way sufficient windfall gains created by urban development can be captured by the mutually owned CLB with sufficient rental income for it to become self-financing. As the cost of land is typically halve the cost of a dwelling, this arrangement eliminates the cost of land for pioneer home owners to half the cost of housing. It also makes commercial investment in rental housing, office buildings and shopping facilities more attractive as the land cost is also eliminated for the investors. However, the investors do not obtain shares in the CLB and so a share in the uplift in site values.

All home owners and tenants obtain one share in the CLB for each square meter of the site they occupy. As only residents can own shares, no non-residents or commercial investors can capture any uplift in land/site values created by the community to extract value from the community. As residents typically only occupy around 20% of the land area in an urban precinct, the area of land in which residents obtain an ownership interest through the CLB becomes five times greater than a homeowner with a conventional unitary title.

Home owners can finance and sell their dwellings in the usual way. However, for the buyer to obtain title to the house she/he must buy at market value the CLB shares held by the vendors that are redeemed by the CLB and resold to the buyer. The redemption price discount reduces from 100% to zero over the time required to write off the dwelling for accounting purposes. The profit obtained by the CLB in redeeming its shares and reselling them at market values provides another source of income to allow the CLB to become self-financing.

Because the CLB becomes self-financing, its shares can be gifted to pioneer home buyers. As investors cannot acquire CLB shares, tenants in rental properties can likewise be gifted shares over the period their rental properties are written off by their owners for accounting purposes. Co-ownership rights to rental properties are acquired by tenants without cost at the same rate that the property is written off. This does not reduce the reported rate of return for

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investors. As co-owners tenants have an incentive to undertake repair and maintenance to increase the return of investors who already obtain higher returns by not needing to buy land.

In this way CLBs capture the “surplus profits” not reported by accountants and not recognised by economists (Author 2006). Surplus profits help make CLBs self-financing on a sustainable basis that is augmented by the capture of windfall profits. The above arrangements demonstrate how ecological property rights increase efficiency and equity. The same arrangement can be introduced for the ownership and control of corporations. This is considered in the concluding next section that contributes to the vision in Table 1 of a world composed of ecological communities.

### **4. Building Sustainable Communities**

In this section the application of ecological property rights to corporations are considered to complete a vision for a sustainable ecological form of capitalism.

The existing property rights of corporations introduce seven deadly sins of capitalism. First, corporations are inefficient and second inequitable in allocating resources by over-paying investors with surplus profits not reported by accountants and not understood by economists. Third, corporations do not share profits with their stakeholders on whose contribution they depend for their existence to make profits. Fourth, corporations alienate employees by not sharing power with them and other stakeholders requiring government to protect stakeholders with laws, regulators, regulations and their associated bureaucracies. Fifth, corporations can acquire more resources, social, and political power than some levels of government yet are not required like governments to be directly accountable to the stakeholders whose lives they affect. Corporations are not kept to human scale and are allowed to become “too big to fail” (Pirson and Author 2010). Sixth, identity of corporate ownership can be hidden with owners voting on a plutocratic basis that provides the wealthy with the most votes. Seventh, corporations undermine democracy by their influence over the political process and by providing government sponsored services.

All seven sins can be ameliorated and/or removed by introducing stakeholder corporations with network governance as described in my public policy pocket book: *A New Way to Govern: Organisations and society after Enron* (Author 2002). No changes in the law are required to create Ownership Transfer Corporations (OTCs) governed by their stakeholders. OTCs can be introduced by providing tax incentives for shareholders to vote for corporations to adopt ecological property rights as described in my 1975 book on *Democratising the Wealth of Nations* (Author 1975) and developed further in Author (2000a).

OTCs can be formed by corporations creating investment shares that last for 20 years, like patents to create a level playing field for investors. The corporation would also create stakeholder shares that over the 20 years acquire all the property and voting rights of the investment shares. Stakeholder shares would be issued without cost to voting residents of the host community who were suppliers, employees or customers according to the value of their contributions. In this way all OTCs would become locally owned and controlled to eliminate the draining out of the community profits that Penrose (1995: 79) described as ‘unknown, unlimited and uncontrollable’.

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Besides being more economically efficient by limiting the export of surplus profits OTCs distribute wealth according to the contributions of its stakeholders. Stakeholder ownership and their representative councils would be controlled on a one vote per person basis with firms becoming accountable to their host community. Firms would not become too big to fail because investors would require all profits to be distributed each year instead of any being re-invested to become owned by stakeholders.

Firms would grow by establishing offspring corporations taking over part of their assets and being freshly funded with dividends from them and/or from other firms. This would also improve the efficiency of the capital markets as re-investment decisions are undertaken by shareholders not managers. The result would be the creation of many smaller firms to improve competition, social and political accountability with the features indicated in Table 4, Existing and Ecological Corporations.

**Table 4, Existing and Ecological Corporations**

	<b>Feature</b>	<b>Existing Corporations</b>	<b>Ecological Corporations</b>
1	Rights to life:	Perpetual	Limited to 20 years like patents
2	Ownership rights	Static and monopoly	Dynamic and co-ownership
3	Owners	Located anywhere	Mainly local
4	Creation of corporations	Entrepreneurs & investors	Entrepreneurs, investors and mature fecund corporations
5	Size of corporations	No inherent limit by investors	Limited by investors short term return of and on investment.
6	Number	As at present	Many more smaller corporations
7	Governance by:	Shareholders in theory but in practice by directors	Competitively and dynamically determined by stakeholders
8	Regulation by:	By government	By stakeholders and so by local requirements

The introduction of stakeholders into the governance architecture of OTCs would also introduce elements of network governance. Pirson and Author (2010) identify how and why network governance in the public, private and non-profits sectors introduces operating advantages and resiliency in organisations. In firms, network governance provides competitive advantages as illustrated by VISA International in the US, the John Lewis Partnership that operates the largest retail chain store in the UK and the network of 250 firms based around the town of Mondragón in Spain that are all locally controlled.

Network governance is universal in nature because of its efficiency, effectiveness and resilience as discussed in detail by Pirson and Author (2010). Network governance decomposes decision making labour to allow widespread engagement of organisational stakeholders in decision making whether or not they are in the public, private, non profit or the emerging “For Benefit” fourth sector (Sabeti 2009). While the decomposition of decision making increases the complexity of organisations it can greatly simplify the role of individuals to allow ordinary people to achieve extraordinary results as achieved in Mondragón and other network governed firms.

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The simplification of decision making and its widespread involvement of community stakeholders provide a basis for both directly enriching democracy and indirectly by providing a basis for introducing demarchy

The type of society that would emerge by introducing ecological property rights to money, realty and firms is outlined in Table 1. The changes required to create a stable state more efficient and equitable resilient society with built-in feedback messages from its host environment are less than the changes achieved from the past. With global population expected to reach its historical peak later in the current century the time for achieving the changes may need to be very much shorter.

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