Complementary Currencies:

Local Sustainable Development

By Matthew T. Richards & Kristian Stephen Søndergaard Colvey

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Sincerely and gratefully yours,

Kristian Stephen Søndergaard Colvey & Matthew T. Richards

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Chapter 1: Introduction

"Swadeshi is that spirit in us which requires us to serve our immediate neighbors before others, and to use things produced in our neighborhood in preference to those more remote. So doing, we serve humanity to the best of our capacity. We cannot serve humanity by neglecting our neighbors."
-Mahatma Ghandi

"The class of citizens who provide at once their own food and their own raiment, may be viewed as the most truly independent and happy. They are more: they are the best basis of public liberty, and the strongest bulwark of public safety."
-James Madison

Where once this lifestyle was regarded by the President of the United States as integral to liberty of all citizens, it is now relegated to small, confined pockets scattered around the globe. Liberalism and centralized currency has divorced the concept of provision so totally from western culture that "eco-villages" are now considered experiments.

1.1 Money as Structure

Humans construct their lives today by exchanging goods and services with each other. The exchange facilitation mechanism which is known as money is essentially the operating system on which society is powered. This operating system is unfortunately not optimized for the environment, nor for the social creatures that rely on that environment. In this project, we will discuss a new, more efficient operating system that can improve our interactions with the environment and each other.

Wealth today is defined by most as the accumulation of scarce currency in order to store future purchasing power. This is a product of modern capitalism which emphasizes the power of the market. This emphasis on the market increases competition and therefore effectiveness via the metaphor coined by Adam Smith as the "invisible hand" [Smith,

1759]. This system has worked exceedingly well for the last hundred years. Humanity has achieved more than anyone could have thought possible during this time. However, this system at present is starting to break down. This is due to the simple fact that capitalism requires a compound 3% rise in Gross Domestic Product (GDP) year after year in order to continue functioning. The reason why it requires this rise in GDP is because the money that is used to finance this growth is created with *interest* attached to it. In order to pay back this interest, it's necessary to grow the business and therefore this business growth when examined in aggregate is defined as GDP. "The debt imperative therefore gives rise to a growth imperative" [Greco, 2010]. The issue associated with this growth is that, at present, it is predicated on humanity's ability to exploit a corresponding amount of resources each year. However, in a finite world, the resources will at some point reach their limit and therefore the system that requires this continual expansion will no longer work [Meadows, 1974]. Therefore, it is not possible to effectively limit consumption within the constraints of a debt usury system without causing the system itself to crash [Lietaer, 2001].

The creation of the World Trade Organization has exacerbated this issue. The WTO has increased the GDP for nearly every economy involved in it. However, along with this GDP increase has come corresponding job loss in developed countries and urbanization in developing countries. The job loss in the developed is due to the fact that with open economic borders, the major corporations need to shift production off shore in order to compete effectively in this new landscape as the cost of labor is on average 47 times lower for developed vs developing countries' incomes [Goldsmith, 1994]. If corporations do not outsource production, they will lose market share to competitors that do, as their costs will be lower and so they can outcompete on price. For developing countries, this urbanization means that culturally pastoral self-sufficient villages are moving off the land into peripheral make-shift housing settlements in hopes of finding work, and making a living closer to western standards. The issue here is the not the increased specialization of systems, but the *reduced generalization* and therefore resilience of these systems. In this project we will explore value exchange systems which are not created with debt and the effect that that can have on communities and consumption patterns.

By broadening the scope of existing measurement methods from GDP (see methodology) to include social and environmental factors, a more accurate quantification of well-being is possible. In order to address the root of the structural problem however, there is a need to not only quantify success more effectively, but also ensure that programs are put into place that ensure we are in a position to act on them.

1.2 Behavioral Implications

Bernard Lietaer, co-founder of the Euro: "Most people consider money to be a passive medium of exchange.... They assume that it doesn't affect the type of transactions that are being performed or the relationships between the people. Both of these assumptions however, have been proven to be false... We have a number of studies that demonstrate very clearly that *depending on what one uses as a means of exchange, the relationships between the people are different*" [Rosenblith, 2009]. Consider this for a moment. The way in which money is accumulated and used actually changes the way in which we interact with each other. The implications of this are enormous, forcing us to reconsider the fabric of exchange on which global society is built.

1.3 On Scarcity & Abundance

Currencies are a promise of future production or material. The problem with the way the current money system uses currencies is that there is often a scarcity of currency, but no scarcity of labor or materials. This means that this method chosen to facilitate commerce is itself restricting that which it was meant to facilitate. It wasn't always this way. Historically, before the Middle Ages if you were a farmer and you turned in your grain at the silo, you would get a receipt that reflected how much grain you deposited. You would then tear off a piece of that receipt for the shoemaker if you needed shoes or the seamstress if you needed clothes. In this way, the money used represented the bounty of the land and the production of the people on it. The disconnect from production didn't happen with the removal of the gold standard, but when money was first centralized starting in the Middle Ages and continuing into the Renaissance. This centralization

required that money was now *lent* into existence, not *earned or worked into existence*. By turning that money into debt and making all of the other currencies illegal, Royalty and Nobility of the time turned those who used the money into those who owed. This type of currency was designed as a way for the ruling class of the time to maintain their power in respect to the rapidly expanding middle class mercantilism [Rushkoff, 2009]. This form of currency is the same currency we use today.

Industrialization in the west has led to the commoditization of money [Milani, 2000], and its currency as an object, essentially deconstructing its value and instead having money assume its own value rather than the wealth of which it represents. Communities of individuals in villages, towns, cities, and regions are more susceptible to potential lack of money created by artificial scarcity. As communities consist of the individuals they comprise, an individual failure to repay debt can be reconciled. Multiple failures of individuals to repay debt because of lack of scarce-money related opportunities can create a collapse in healthy economic and social communities, destroying social and labor capital in the repossession of bank collateral assets, like those of homes and other property [Lietaer, 2001].

Some of the key properties of the currency exchanged today are the abundance or scarcity associated with that money. John Maynard Keynes argued that the way in which money is used today contains an inherent contradiction. Money that is issued by governments today is both a symbol of exchange and a promise of future production. It also holds the contradictory position of representing a store of value, while being used as a medium of exchange. These properties when combined into a single form encourage the removal of currency from circulation in order to 'save' for future use (hoarding). However as a result of the saving, this currency is removed from circulation. This means that even though there is a need for a product or service and the supply to provide it, there is a shortage of currency to enact the transaction - which prohibits commerce from being facilitated for no other reason than there is a shortage of money [Keynes, 1936]. However, mutual credit systems like LETS (see Chapter 3.3.1) are *sufficient* to facilitate trade without imposing artificial scarcity, because it is ledger based, not printed currency [Linton,

2009]. The artificial scarcity imposed by printed money creates a mindset upon which competition is necessary in order to garner enough resources to survive. Currencies that are sufficient promote a cooperative mindset that ensure exchange is facilitated, but that no one feels like they need to take more than they need to survive. The focus is no longer on the personal accumulation of scarce currency, but on the development of communal production systems to create *personal and communal wealth* [Linton, 2009][Lietaer, 2001][Boyle, 2002][Rosenblith, 2009].

1.4 Problem Formulation

How can complementary currencies promote community resiliency, sustainable development and economic & social well-being?

Chapter 2: Methodology

2.1 Project Methods

Undertaking this study will consist of an interdisciplinary approach using economic and social analyses of money and currency use in today's society. This will be done by conducting interviews with experts in these respective fields as they relate to issues of money and commerce exchange in macro and micro scale as well as consulting major texts and research that have defined these fields. From this understanding, the project will focus on the ways in which the deteriorating effects of the commoditization of money can be nullified or made less harmful by use of complementary currencies, like that of community currencies, mutual credit exchanges, time banks, and other non-typical exchange systems that do not necessarily alter the entirety of national or global exchange systems or wholly substitute them, but rather seek to provide for the users a more resilient and equitable system, user generated to ensure a healthier economic environment that encourages social development, independence, and more sustainable practices.

Case study examples of various user generated currency systems will be presented and analyzed to provide insight into the properties of these systems. This will lead to a demonstration of the efficacy of some models while highlighting the portions that are inefficient or ineffective based on a number of criteria set to evaluate their overall sustainability. Every system will contain its own content, purpose, method, and underlying reason for having been implemented. Analysis of past and current complementary currency projects will yield practical advantages and shortcomings inherent in their use and will provide a model for further developing efficient and relevant value exchange systems to any additional communities that may be interested in adopting their own complementary currency.

No one system will be the most effective tool in all cases, so an explication and examination of case-studies will yield the most practical implementation strategies and a

common toolbox for communities of interest who are seeking to adopt a complementary currency system will be created to assist these community entities with finding the program that is suitable for their needs.

A complementary currency adopted by a grouping of individuals is often referred to as a "community currency". A complementary currency could be used by any sized group of population, even by the entire world, A community, however in the scope of this project is a group of individuals ranging between the population of a cooperative, neighborhood, village, town, city, or any network within these geographic boundaries and are defined by their interest and active participation in and desire to use a community currency. The number of members of a community may appear to be arbitrary or even unlimited, but their constituency is defined by common values as the major interest for participation along with, relative proximity in living spaces (neighbors, neighborhoods, streets, boroughs, organizations, and municipalities). This definition will serve the purposes of illuminating and understanding the needs of a population that wish to employ this community currency system. It will be limited in some instances, based on a number of factors including living space, proximity, use for the community currency, number of interested and active participants, and critical mass in its usage necessary for community currency to be a viable tool to ensure that the desired effect of its implementation becomes visible.

A community may also be defined geographically by proximity, an internal confederation inside a larger habitation network such as a village, town, or city, consisting of individuals connected and interacting around central hubs (i.e. main street, local institutions). It is a loose relationship of all individuals occupying, sharing, and interacting in some manner around a hub.

This project takes its cue from the work of many others working both independently and conjointly on matters of sustainability, resiliency, social well-being, and monetary economics. They are intertwined in a manner that leads the authors of this project to re-assess the world in which we live to understand its relationships on a scale where change

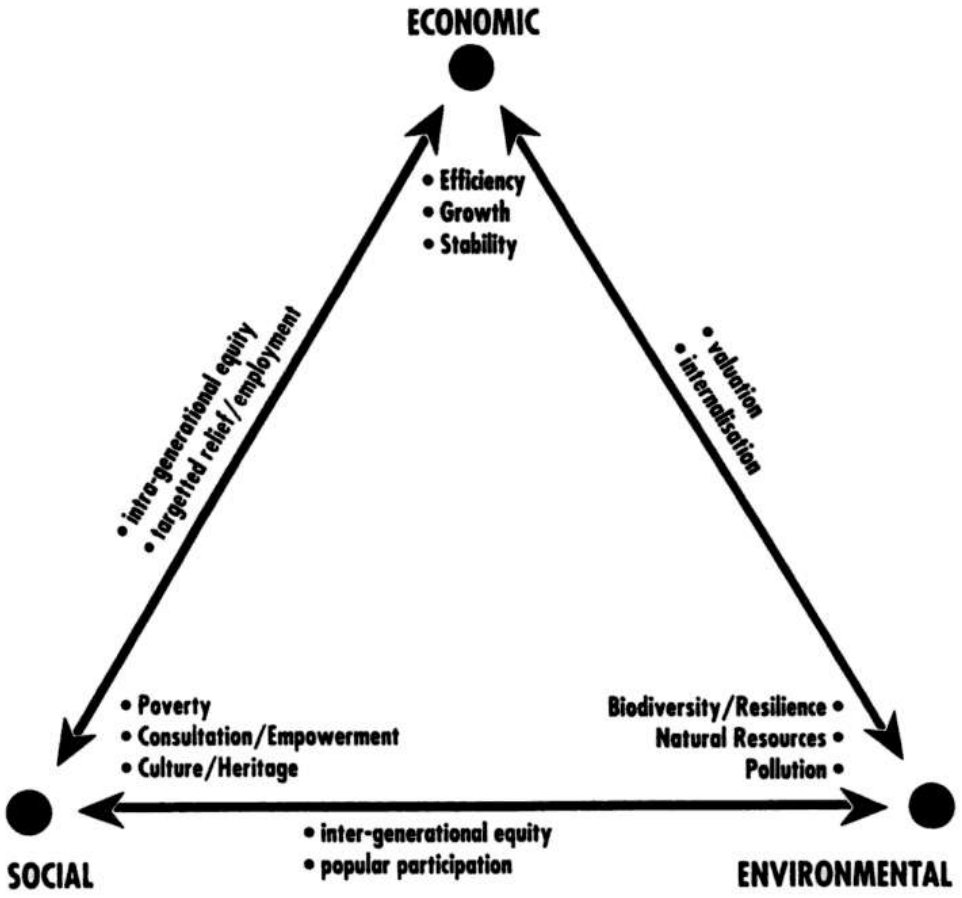
can be made, at the grassroots level and while having a marked affect on systematic issues relating to the nexus of community, well-being, and exchange.

2.2 Theoretical Framework

A landmark paper presented by Mohan Munasinghe at the United Nations Earth Summit in Rio de Janerio in 1992 establishes the essential cornerstones of social, economic, and environmental as essential and integral parts of sustainable development strategies. Without the foresight to see where decisions made in one aspect will affect the other, development could be skewed toward the benefit of one while at the sacrifice of the other. This has been classically true when economic concerns are laid in juxtaposition to environmental or ecological concerns. This relationship has been realized for the most part in the development since the Industrial Revolution to be a flow of environmental and ecological goods (raw natural capital) that are utilized in an efficient way, which has developed into study of economy (the definition of what is meant by "efficiency" typically applied to the short term transformation process and corresponding focus on growth) [Munasinghe, 1993].

The following diagram (Figure 1) demonstrates the interconnectedness and interdependence of the three cornerstones of sustainable development considerations.

Figure 1.1 Tradeoffs among the Three Main Objectives of Sustainable Development



Source: Munasinghe (February 1992).

The underlying importance of the interaction that these three themes represent share a dynamic about the maintenance of stocks, where a stock is an aggregate measure of some resource at a particular instance in time. For example in the realm of the environment that could be understood as the maintenance of ecosystems (through maintaining biodiversity) to support the limiting of capital transformation of some resources into essential and non-essential goods or services for supporting human livelihoods, and the long term sustainability of such a practice [Hanley et al. 2007][Lietaer, 2001][Munasinghe, 1993][Seyfang, 2006] .

From an economic point of view, the efficiency of this transformation is the most important consideration, but there is a deep necessity for addressing the maintenance of the capital stock that permitted the initial transformation in the first place, whereas disregarding capital stock spurring economic development leaves an imbalance that could potentially feedback on itself. Efficiency regardless of long-term environmental, and social degradation has been the current of mainstream practice, unwittingly or not . The relevance for the considerable need for movement towards sustainability has highlighted the externalities produced by the current global market system in relation to its transformation of natural capital into consumable goods and services [Munasinghe, 1993][Seyfang, 2006].

The socio-cultural consideration includes the maintenance of stocks as it relates to human capital, and taps social capacity building as an inclusionary part of the total human network that affects both other cornerstones, where socio-cultural interactions are responsible for the functioning of human networks as they relate to the environment and the corresponding use of those resources in the construction of the economy [Munasinghe, 1993][Seyfang, 2006].

2.3 Application of Theory

Drawing on this theoretical framework, where desirable sustainable development effects or considerations are the result of addressing implications with respect to the other cornerstones, a methodology for such development could be provided that focuses on a particular theme with direct or ripple benefits to the other themes. In this way approaching a strategy with such goals in mind lends itself to the overall enhancement of well-being, even if it is initially localized on a specific area or network.
A very simplified linear chain, in this case representing an anthropocentric perspective on sustainability, could in some respects be applied to understand the the interactions of the three cornerstones as they relate to the broader nature of human influence on sustainability efforts. This is represented as follows:

1) The environment is the basis for needed sustainability efforts because it is the basis for human livelihoods.
2) The economy, including associated and integral institutions, serves as the tool to make necessary changes.
3) The socio-cultural sphere benefits from the changes made in enhanced ability to provide for current *and* future generations.

A complementary currency adopted for these specific functions contains the essential criteria to satisfy the needs that sustainable development strategy possesses. This is to say that reasons for adopting a complementary currency system may indeed have a focus that lies more closely aligned with one cornerstone or theme than another, yet is not isolated from the appreciable effects it has on the others. For example a complementary currency adopted by a community of residents in an economically depressed region for the purposes of increasing the economic well-being of the community of participants, will presumably focus on the economic capacity building necessary for attainment of this desire for a relatively higher level of well-being. This however may not be in exclusion of the secondary social benefits reaped by community members for their enhanced participation in this system, nor the increased interconnectivity of participants which is a function of social capacity building, community building, and inclusion. Further, enhancement of local economic well-being may lead to increased utilization of local natural capital resources for products to be consumed locally, lessening dependence on the influx of goods and services and the associated environmental deterioration attached. The same applies to the other underlying reasons for adopting a complementary currency in a community. The *additional* benefits attached to implementation will be integrated, further enhancing accrued enhancement of well-being.

2.4 Contextual Definitions of Sustainable Development

Our Common Future, better known as the Gro Brundtland Commission Report, offers the most widely-accepted definition of sustainability from a global production and consumption stand-point, "*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"* [WCED, 1987]. This will serve as the basis for defining the specific attributes of sustainability and resiliency as discussed in this project.

The concept of sustainability presented in this statement leaves a fair amount of room for an open-ended interpretation of how to accomplish this. The frame of reference therefore can be adjusted to target specific practices and processes that fulfill the general requirements of the definition while having a more precise target and distinct context of meaning. Sustainable development in the scope of this project will consider the role of the individual as a participant in a community framework and the habits and decisions made in both respects that affect consumption and production practices locally and globally, and how this behavior intersects within the greater lattice of the economic, social, and environmental. When seen from a holistic perspective, sustainable development implies a necessary change over of systematic production and consumption processes to affect balancing of these three cornerstones of sustainable development.

As a single community has little influence on systematic issues of this nature, and because they are for the most part reliant on these systems, sustainable development can be critically defined as a *movement towards* the ideal of total sustainability, without being mired by the realization that they themselves do not enact a perfect model of sustainability. This in many ways is a move towards self-sufficiency, in which production and consumption is localized with the added requirement that significant environmental deterioration is not caused. Development of local agriculture, and energy production are both examples of self-sufficient actions that have relatable impacts on external production and consumption. Developing a measure of self-sufficiency is a way of

garnering production and consumption that can be assured to meet the social, political, and economic standards for which it was created, thus removing some complicit hidden externalities (i.e. depletion of resources, environmental deterioration) of global production-consumption cycles.

This is also a dynamic of building resiliency. Resiliency is resistance to external shocks. With a self-sufficiency model of sustainable development, the establishment of local production will reduce dependence on external markets, influences, goods, services and the negative affects that massive fluctuations in the import of these have on individuals and the community that they inhabit. In this way the over-arching theme of sustainability as it refers to a community in this project is most strongly connected to self-sufficiency and resiliency.

2.5 Complex Systems: Ecosystems to Human Networks

Ecosystem modeling has yielded basic principles related to understanding and measuring the health of a biosphere in a given area. These two fundamentals are biodiversity and interconnectedness. Biodiversity relates to the aggregate measure of organisms living within the same given area, where the higher the number of different types of organisms, the healthier the biosphere. The interconnectedness of the system is also a measure of health as it represents the interdependence of the different facets of the biosphere and how they relate to its functioning in terms of the cycling of biomass and nutrients. This is typically represented by ecological niche, where the increase in strata of niches is related to the overall interdependence of the biosphere. [Cunningham et al., 2009] Sustainability for a complex ecosystem could then be argued as the long-term maintenance or balance of these two principles in that ecosystem.

Bernard Lietaer adapts this analysis in a holistic perspective of global money regimes, whereby the derivative examples related to human or financial networks are concluded into efficiency (the capacity to process volume) and the resiliency (ability to adapt to shock). The conclusion is that the efficiency derivative is actually counter opposed to the overall diversity of the system, whereby focusing on efficiency leads to the development of a monoculture by establishing channels for the processing of volume, which hinders resilience. Lietaer, further applies the monocultural perspective to the current national bank-debt currency in use world-wide today [Lietaer, 2010].

Collapses inadvertently affect everything that it is attached to the market where the collapse occurred including foreign investment tied to liquid financial markets. The monoculture on type of currency, is essentially an optimization for efficiency purposes at the expense of the resiliency that a multi-currency system could provide. Lietaer offers the amusing allegory of current bank-debt currency as something similar to a single multi-use tool like that of a rock in the stone age, where one might be able to kill an animal with it, then use it to eat with and afterward to clean fingernails with, but it is not the best tool for all of these scenarios, "...rather primitive" is how he describes it. He argues that a diversity in currency types fosters resilient development through a specialization and adaptation to the domain that it is best suited for. In essence the tool of currency can be optimized in different ways to effect facilitation in domains or sectors where it makes sense to use different standards of value, rather than be dependent on the measure of value related to one national bank-debt currency [Lietaer, 2010].

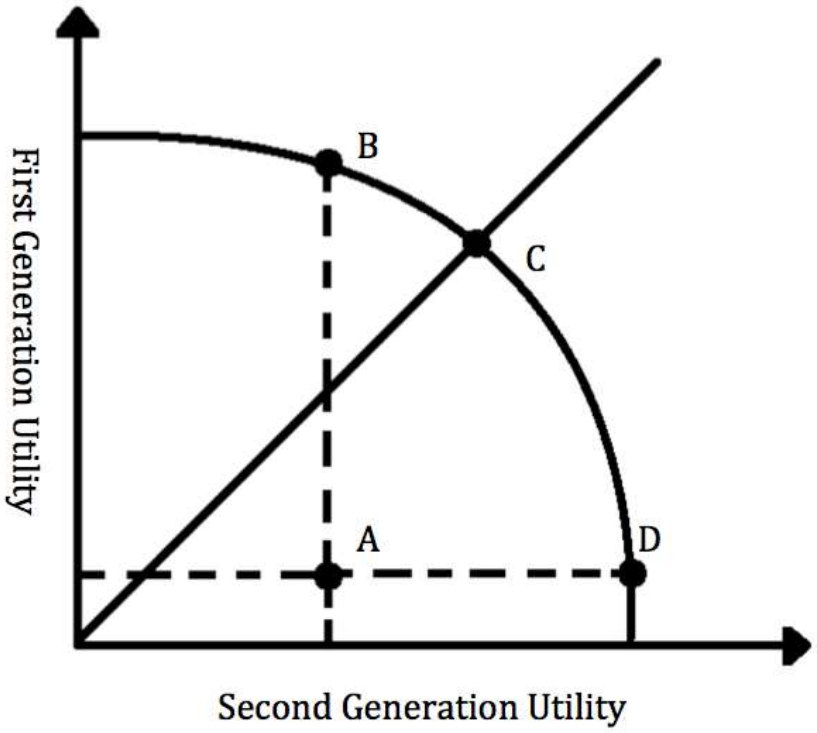
2.6 Redefining Local Sustainable Development

If the "who" of sustainable development is the individual in the community, the "what" is invariably linked to what is being consumed. While the obvious association of sustainability concerns long term maintenance of stocks of materials and environmental goods and resources, this could also be applied to other forms of stocks present in a community as well, notably economic (fiscal) and social capital. These can and will directly relate to the ability of community members to make broad horizontal (non top-

down) changes in their consumptive patterns and their overall ability to *move towards* sustainability, as changes require the modification in the use of those essential fiscal and social capital resources. In this manner sustainability, self-sufficiency, and resiliency is preceded by the ability to move towards these goals in the first place. Rethinking sustainability in this manner allows for an understanding of the value necessary to achieve these goals, and is fundamental to the process by which these goals are to be met. Therefore on a community scale, the economic, and socio-cultural health of a community is related to the maintenance of fiscal, social, and human capital. Resilience as explored in *Environmental Economics* [Hanley et al., 2007] can be viewed as a sustainable development strategy because it involves the maintenance of a system functioning over time. This has been supposed as a development of flexibility and adaptability, and is related primarily to biodiversity. If a community is interpreted as a population in an ecosystem, constituent of its members, the adaptability of a maintenance of biodiversity can also be applied to a community setting, wherein the survival of a region or community is dependent upon its variety and ability to withstand external shocks.

Strong Sustainable development calls for maintenance of minimum levels of stocks, rather than their depletion or utter transformation [Hanley et al., 2007]. Communities possess in micro all types of resources necessary for stock maintenance like that of manufactured capital, human capital, natural capital, and social capital. For environmental goods correct valuation of these capital goods leads to efficiency of the market [Hanley et al. 2007] at the expense of utility for future generations (Figure 2)

Figure 2 Efficiency vs. Sustainability



Source: *Environmental Economics* [Hanley et al. 2007]

Following the interpretation of a community as an eco-system, community members' aggregate financial and fiscal capital, can be treated as environmental resources. The curve represents a utility possibility frontier across first and second generations. Generations in this instance can be interpreted as open units of time. Incorrect valuation of resources may yield for example point "A", where the utility value lies within the boundary and is inefficiently utilized. Precise valuation for optimized production leads to point "B" where the utility value of resources is maximized efficiently at the expense of equitable share of resources with the 2nd generation. Sustainability is thus defined as the equitable sharing of utility value of resources "C" across generations [Hanley et al. 2007].

Communities depend upon the physical, social, and governmental infrastructure they lattice to hold together their collective share of values. These can be organized into cities,

towns, villages etc. As a municipality serves its collected citizens in the delivering of services such as electricity, water, heat, waste disposal and physical infrastructure, they depend on the same scarce money that individuals, collected or not, depend on to provide these services, like that provided though property taxes. Increasing growth for a community means additional growth in demand for services pushing municipalities to secure more and more tax revenue to meet this demand.

One way that communities and the municipalities often secure more tax revenue is by attracting investment generated by retail and shopping. Done on a local scale where businesses are owned and operated by community members is a way to influence recirculation of money via the multiplier effect through the community, though this can be harder, and is typically more financially risky, compared to the benefits that proven corporate retail chains offer, like that of Wal-mart in the USA. Large multinational retail corporations of this sort, although offering a large source of tax revenue for communities by locating themselves in or near communities, shuffle money spent by the community away into larger and different economic sectors as consequence of centralizing tendencies. Circulation of locally spent money is then shipped away to larger non-local headquarters. This is essentially the siphoning of massive financial capital away from the local community in a redistribution of money, outside of the community. This alone is not the only thing responsible for creating deterioration in the community, but without investment and recycling of money through communities by its constituents, the various forms of capital for sustainable or resilient growth become harder to muster [Rosenblith, 2009].

In a practical sense on community scale, capital investment of resources (labor and land availability and a community's economic health) for the acquisition of tax revenue, by attracting large retail businesses like of Wal-mart (Large corporations of this sort enhance the centralization of money) is a movement of point "A" to point "B" which is a matter of efficiency as relates to ability to provide essential services. This movement has repercussions for the community as tax revenue, gathered in the first generation, comes in expense of the aggregate financial, fiscal, and human capital of community members in

the next generation because of losses of competing local business that consist of community members. On average for every two jobs that Wal-mart brings into a community, three are lost from competing businesses [Rushkoff, 2009]. Loss of local business can be likened to the loss of essential elements of minimum distribution of biodiversity in an ecosystem. Thus sharing of financial resources in this regard across generations (units of time) leads to an inequitable distribution of social, human, and aggregate community financial capital across time, weakening community resiliency.

2.6.1 Weak vs. Strong Sustainability

Successful arguments for implementation of rules of weak versus strong sustainability as measured by the distribution of the finite stock of human, social, and financial capital of a community depend upon the distinction and understanding of the results of what happens to a community's capital stock under these rules [Hanley et al., 2007].

Weak sustainability will account for the transformation of community financial capital into various other forms, like that of jobs for community members. This is often a preliminary argument by communities for securing large retail property tax revenue. This however, assumes that a market is complete, which on a community scale is untrue, by the very nature that the transformed capital is part of an entity that functions on a national or international scale. This therefore accounts for only a partial transformation of community capital resources, and thus an unequal utility of community capital resources across time.

Strong sustainability rules call for strictly enforced safe minimum standards (SMS) [Hanley et al. 2007]. Again treating the community as an eco-system, the maintenance of these minimum standards in stock of community capital is paramount to making their utility last across generations. Community currency is the implementation of SMS for a community's various capital mentioned previously. The maintenance of a store of value, translated as credit exchange, ensures that capital, although utterly transformable across types of transactions, is not leached to the external market nor

susceptible to 'capital flight'. Community currency does not wholly isolate the community from the utility value of its resources but repurposes some of them to preserve a cycle or flow of money essential to the *continued* development of a community without exhausting aggregate financial capital, while more efficiently utilizing human and social capital by tapping informal economic activity and valuation of non-market goods and services as an integral part of total stabilization.

2.7 Issues with Conventional Metrics

One of the foremost concepts used by economists, and policy-makers the world over to assess growth, is through use of measurement of gross domestic product (GDP). While this measurement can more precisely measure output of an economy as a summation of its goods and services in relation to previous allotments of time, it has increasingly come to light that it may not be an accurate measure of the growth of well-being of the economy that it represents. That is to say, GDP measures market growth, rather than holistic growth of a society or nation. While this metric is fair to account for the relative appreciation of products to be consumed it is a measure of stock and supply rather than total consumption. This is an essential difference because total products produced does not take into account stocks of finite resources consumed in the production process, moreover neglecting the value over time of essential resources that create those products. This in itself demonstrates a broad disconnect between GDP measurement and measurements of sustainable practices [Jackson, 2004][Stiglitz, 2009].

GDP as a measure can also be inflated or constrained by feedback or precipitative effects relating to those consequential non-economic actions caused by certain decisions in the market. For example, increased traffic leads to higher consumption of gasoline which is included in total GDP, but does not account for:

1) The higher pollution caused by increased traffic and its deleterious effects on the environment such as a contributor to climate change.

2) The affects of this air pollution on the health of individuals who then will make decisions based on relative health to seek healthcare services or not, and the unforeseeable affects of their role in the market and further, the economy [Stiglitz, 2009].

Money is the primary measurement of GDP, though the liquidity of money and its affect of valuation of some goods and services, misses the potential production that is based more closely on the connectivity provided by communities of individuals in the informal economy that provides the foundation that the formal economy stands on [NEF][Seyfang, 2006]. It fails to measure the provisional shift of non-market to market services, and vice-versa, that is based on an ever-changing standard of living. As standard of living is proportional to income, variations in income for a collected community will affect this shift in market to non-market/ non-market to market goods and services in a more direct fashion, that cannot be indicative of the increased well being that per Capita measurements imply [Stiglitz, 2009].

2.7.1 On GDP & Growth

Source: Polyp.org.uk

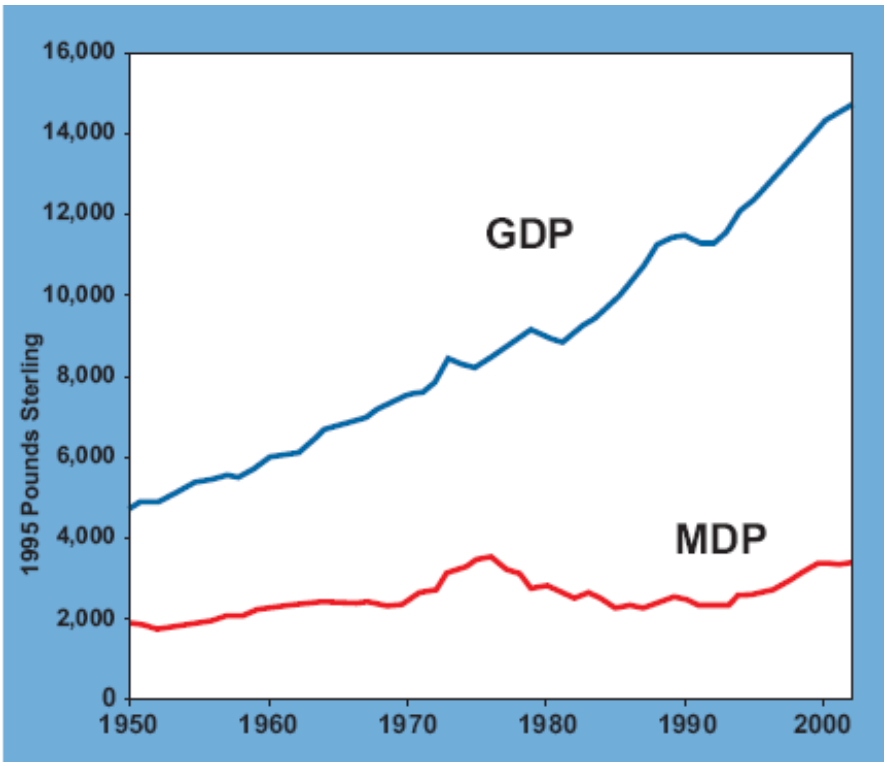
Robert Kennedy, the late United States Senator, acknowledged the problem with GDP in in the 1960's: "*(GDP) is indifferent to the decency of our factories and the safety of streets alike. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. The [GDP] measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country. It measures everything, in short, except that which makes life worthwhile*"

The New Economics Foundation (NEF) was created in 1984 to address "economics as if people and the planet mattered" building on groundbreaking work by E.F. Schumacher in his book *Small is Beautiful: Economics as if People Mattered* [Schumacher, 1973]. It released a report in 2004 entitled "Chasing Progress" which defined the disconnect between the values Robert Kennedy touched on and the "progress" being made as implied by using GDP as a progress indicator. Figure 3 shows this discrepancy within Britain. Their metric, MDP, is defined as a measure of domestic progress. It's a combination of 147 indicators measuring indicators as "diverse adult numeracy and literacy, social investment as a percentage of GDP, crime levels, river quality, populations of wild birds, and so on, as well as the GDP itself" [Jackson, 2004].

Key differences between MDP and GDP:

- Spending to offset social and environmental costs (defensive expenditure) is taken out.
- Longer-term environmental damage and the depreciation of natural capital are accounted for.
- A number of economic adjustments associated with ensuring prudent investment and trade balances are made.
- Changes in the distribution of income are accounted for, reflecting the fact that an additional pound in the pocket means more to the poor than to the rich.
- A value for household labor is included.

Figure 3: GDP vs. MDP in the United Kingdom Over Time



Source: *Chasing Progress* New Economics Foundation [Jackson, 2004]

In 2008, Nicolas Sarkozy, President of France, was perhaps the first leader of a country to publicly acknowledge the problem with growth and suggest that the world needs to seriously rethink how success is defined in order to accurately reflect the societal and environmental impact of growth. He commissioned a report [Stiglitz, 2009] that concluded that a more holistic approach to data collection and measurement is necessary. Some relevant recommendations are highlighted below:

"1) Broaden income measures to non-market activities

2) Measures of both objective and subjective well-being provide key information about people's quality of life. Statistical offices should incorporate questions to capture people's life evaluations, hedonic experiences and priorities in their own survey.

3) Well-being is multi-dimensional and all of the following factors need to be considered simultaneously:

i. Material living standards (income, consumption and wealth);

ii. Health;

iii. Education;

iv. Personal activities including work

v. Political voice and governance;

vi. Social connections and relationships;

vii. Environment (present and future conditions);

viii. Insecurity, of an economic as well as a physical nature."

[Stiglitz, 2009]

2.7.2 Localization as a Means

The stakeholders that will be most relevantly involved in securing that these new domestic measurements (rounded out by including various other indicators) will be more dispersed and widespread, therefore decision-making will in essence be more decentralized. However, the decentralization of this decision-making process, in the form of collective action on part of smaller locales will allow for advancement, especially in the attainment of sustainability goals, that are more adaptive and specialized to meet the required change given the area of interest. This affords the opportunity for protection of local and foreign environments, with respect to involvement of the social and economic actors responsible for collective action in these areas [Seyfang, 2006]. Conducting change on this scale, loosens some constraints against collective change of mainstream consumption patterns, by advocating internal change in reaction to external institutions such as national monetary systems and currency regimes. The local, is the site of the blending of the formal and informal economy, and therefore is the most suitable arena for addressing change in the use of external institutions. Therefore the local can be the most proficient in changing patterns that will encourage constructive reciprocal reinforcement of the formal and informal economy in pursuit of sustainable development goals [Jackson, 2004][Schumacher, 1973][Seyfang, 2006][Stiglitz, 2009]. Additionally, decentralized development of electrical infrastructure has been proven to be as much as 10 times more efficient and cost effective than large scale infrastructure projects [Lovins, 2002].

Chapter 3: Analysis

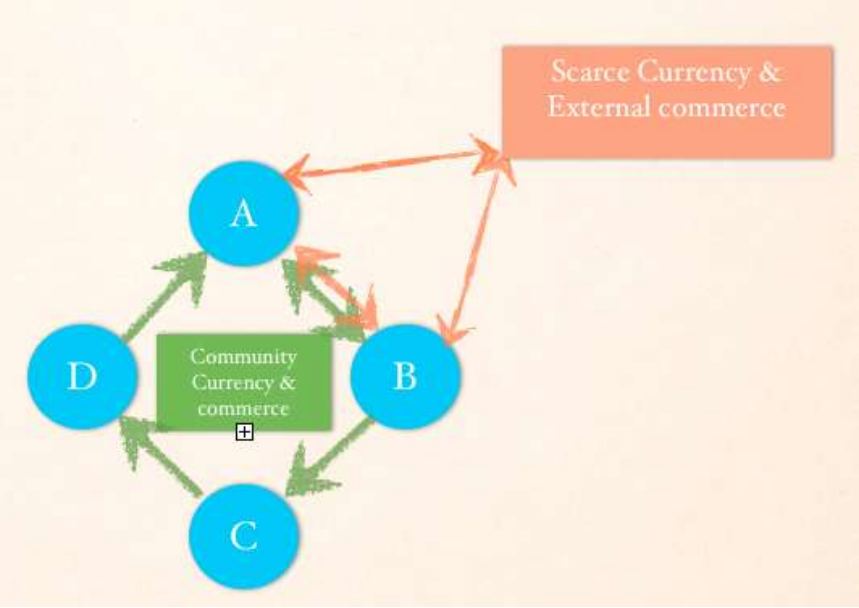
3.1 What is a Complementary Currency?

Complementary currencies are designed currencies that work in tandem with mainstream currencies to facilitate more effective exchange than is possible within a single currency system. An example of a complementary currency system is the Ithaca HOUR, used in the city of Ithaca in the state of New York, USA which uses the United States Dollar, and their own Ithaca HOUR for transactions. In this way, there are multiple currencies that facilitate exchange. Each created to serve a separate purpose and provide a specific benefit to those currency's users [Lietaer, 2001][Linton, 2010].

3.2 How Do Complementary Currencies Flow?

The following diagram is based on the work of Michael Linton, creator of LETS [Linton, 2010].

Figure 4: Hypothetical Community Currency Flow Vs. Scarce Currency Flow



The blue circles (A,B,C, and D) are representative of members of a community. The orange lines in the diagram above represent the flow of scarce national currency. The green lines represent the flow of a complementary community currency. There are a few major distinctions evident when considering how currency flows in this diagram:

1) Scarce currency only reaches 2 of the 4 members of the community above. The other two members of the community are left out of the commerce loop because there is not enough scarce currency to go around (they are unemployed).
2) Community currency stays within the community, it is locally bounded because it is not recognized or accepted outside of the sphere of the community.
3) Scarce currency is tied to import of foreign production and commerce and therefore foreign materials and labor.

These complementary currencies therefore work in conjunction with one another to achieve separate functions. The local currency ensures local commerce is facilitated, while scarce currency is used to facilitate commerce in the world marketplace.
Some of the benefits for creating a closed loop in which the currency circulates is part of the concept of developing an economic multiplier for a "multiplier effect" on internal commerce and production for the community [Lietaer, 2001][Linton, 2010]. The multiplier effect is the amount of relative economic change created by the production or spending of a given amount of currency within a given area [Miller, 2010]. The reason for such extreme focus on this concept especially for complementary currency is that the multiplier effect is a measure of how much *extra* economic activity can be generated by a single transaction within a certain space. Placing boundaries on where a currency can operate is essentially creating a guarantee that the multiplier effect will be maximized to occur internally, "locking in" an amount of value.

There are several types of economic multipliers concerning a community [Miller, 2010]:

1) Output Multiplier - this measures the total change in sales to the community earned from revenue for the export of goods and services outside of the

community plus the revenue added by the transformation of that revenue into sales within the community.

2) Employment Multiplier - This measures the change in employment as the result of the export of goods or services combined with the additional empoyment created by the spending of the revenue within the community.

3) Income Multiplier - This measures the change in income for the surrounding community based on the change in income for the producer of the exported good or service.

4) Value Added Multiplier - This measures the value added to the community in terms of increase in amount of taxes distributed to the community, change in property value, and increase in employee compensation.

3.3 Types of Complementary Currencies

3.3.1 LETS "Local Exchange Trading Systems"

LETS generally refers to a variety of mutual credit systems following the 1983 LETSystem design by Michael Linton in the Comox Valley, Vancouver Island, which removed the extractive brokerage and ownership aspects of so called "commercial barter" systems to meet the administrative and ethical requirements for a community service. Reasons for the development of the project were as a means to facilitate trade in high-unemployment areas caused by lack of scarce national currency resources. This is the most dominant complementary currency system in use today. The structure was originally modeled after a mutual credit company, but operates as a non-profit, minus membership fees for overhead costs [Lietaer, 2001].

Mutual credit systems work on the balancing of credit and debit, whereby credit is created by the selling of a product or rendering of a service and a debit is created for the receipt of the product or service. This leads to a total balance of zero, which is the

standard by which mutual credit is maintained. This is differentiated from bartering in that barter which is typically done on a reciprocal basis, is not related to the exchange of currency (even electronically) but rather an exchange based on agreement of matching value. Typically the only overhead costs deal with operating costs of keeping a ledger system for the tracking of exchanges, and the credit-debit relationship is only generated at the agreement of the transaction, but is a currency, because the balance can be made by a transaction between other participants in the program, who then may exchange their credit or work off their debit with someone else than with whom the original transaction was first conducted [Lietaer, 2001].

As of today, LETS has spread to 35 countries across 6 continents. It has seen its most prevalent adoption in the United Kingdom as of 1996 with over 400 LETS operations underway, encompassing roughly 40,000 members. Since there has been some shrinkage and consolidation leading to about 300 systems with an estimated 30,000 participants. [lets-linkup.com][letslinkuk.net][Lietaer, 2001].

Michael Linton, Creator of LETS defines some practical differences in the use and origin of open currency (which may include a community currency) and conventional currency in a series of documentary films directed by Alan Rosenblith. The following Figure is a summation of the core concepts in Linton's comparison of these systems as it relates to a community entity [Linton, 2009].

Figure 5: Comparison of Currencies

Criteria	Conventional Currency	LETS
Flow	Moves in unlimited directions. Unrestrained flow into and out of the community.	Moves only within the community of participants.
Quantity	Scarce (limited)	Sufficient (unlimited) only meets the transaction needs of participants
Source	Issued as debt with interest by banks, enters the community through external entities.	User generated credit-debit, balances at zero.

3.3.2 Time Dollars and Time Banking

Initially created for a retirement home in Florida, a social project in Washington D.C., and a school district in Chicago, the time dollar invented by Edgar S. Cahn, has spread to over 20 countries across 6 continents, as a service exchange facilitator. The time dollar functions in much the same way as a LETS network transaction does, though it is primarily used for service exchange valued in 1 hour intervals. The purpose of this system is to create a database of services and goods available to participants which will enhance community interaction, build individual and community well-being and connects

those whose needs may be unmet, with those who possess resources possible to meet them that may have before, remained under-utilized [Lietaer, 2001][timebanks.org]. Time dollars are exchanged mostly around the idea of services but has been adapted for hundreds of different uses. It is typically conducted on a one to one basis, but where the credit-debit created by the transaction can be applied to other transactions with other participants. The central idea is that the resource value of a service exchanged does not necessarily have to be appropriately compensated for in exchanges. In fact many times, there may exist a disparity in resource requirements in the services rendered, but the concept of the time equivalent exchange outweighs material or resource cost for the transactions; everybody's time is valued equally. The purpose for time banking is the enhanced interaction between participants that this encourages, and the social benefits of connectivity that this fosters and develops in matching needs with those able to meet them [Lietaer, 2001][timebanks.org].

Time banks are an organization for the monitoring and ledger or book-keeping of accumulated time dollars, and serves as a coordinating body that acts towards connecting people with services needed with those that offer them. Under the current United States Internal Revenue Service (IRS) rulings, transactions employed using time dollars or time banks are currently tax-exempt [Lietaer, 2001][timebanks.org].

With the decentralization of the welfare system beginning in 1996 in the United States and the burden of welfare falling on individual states, states like Missouri have adopted time dollars and time banking as an essential part of their internal welfare development system. The state of Maine became the first state to have an official government post called a "Time Dollar Coordinator". Research done into the positive social affects of the operation of these systems has seen that the volunteer rates in a time dollar program included as much as one third of volunteers having never previously volunteered for anything before, and that the burnout rate which is a critical specter haunting many volunteering organizations dropped from the typical 40% to 3% [Coughlin et al., 1990][Lietaer, 2001].

3.3.3 Scrip

Scrip is an issued material form of currency of non-legal tender, typically in which printed notes, tokens, or other material objects are used and exchanged. Historically, scrip was used as a form of credit offered by businesses, employers, and industry in times and areas that lacked access to national bank-debt currency. It has since evolved into a form of non-legal tender tradable among various "backers" who support the value that the scrip represents. It has been employed in a number of different settings, most notably as a community currency in Ithaca, New York USA, [Glover, 2010] and in Wörgl in Austria during the Great Depression. [Lietaer, 2001] Both will be explored later in the case study examples.

3.3.4 Loyalty Currencies

The concept of loyalty currencies is nothing new and has in fact been employed by the business, retail, travel, and hospitality sectors for a number of years. The most widespread and well known loyalty currency in use are airline miles. While the concept was originally started as a marketing scheme to encourage loyal patronage to one airline or another in terms of rewarding customers with additional travel points, the market and versatility of airline miles has expanded to include many external uses including trading for rental cars, hotels, retail shopping, dining, and many other activities not necessarily related to air travel. The proliferation of these trading schemes is at once a parallel currency to that of national bank-debt currency, and a market facilitation tool for the development of the tourism industry. Similarly the hospitality and credit industries have employed a rewards system to accompany regular use of their services, with the same exchangeability across various other uses than the original intent, including redeem-ability for retail items, travel, and many other uses [Lietaer, 2001].

3.4 Case Study Examples

3.4.1 Complementary Currencies of the Past and Present

Wörgl, Austria

As of late 1932, the Austrian town of Wörgl, contained approximately 4500 residents, 1500 of which were either unemployed or underemployed. The mayor at the time, Michael Untergugenbergen, had a host of works projects that he wished to be accomplished including the re-pavement of city streets and the rebuilding of the town's water delivery systems, yet had only a minor funding source to finance the desired projects that would not have been enough to complete them all. The money to finance the development and beautification projects for the city was created by the deposit of the city's fund of 40000 *Schillings* into a local savings bank, acting as a guarantee for the issuing of a local stamp scrip for the same amount to be distributed as payment for labor and materials for the projects. Following the concept of a "demurrage" charge, a key influence from the work of Silvio Gesell [Gesell, 1890] (see chapter 4.4.2). The scrip issued required a stamp of validation monthly at the cost of 1% of face value. Those to whom the stamp scrip was issued were thus inclined to spend the scrip rather than hoard it. The demurrage charge was then used to finance a soup kitchen to feed over 200 families which were without any monetary resources whatsoever. Records show that the during the 13 and a half months of operation of this system the scrip circulated 416 times generating a turnover of 2,547,360 S*chillings*, approximate to $7.5 million USD in year 2000 dollars. This was in essence a rise in 219% of productive assets over the previous year, where the scrip generated 12 to 14 times more employment than *Schillings* used in parallel [Boyle, 2002][Lietaer, 2001].

The scheme was effective enough that not only were all the projects the mayor had outlined completed within this time period, but the construction of new houses, a ski jump, and a bridge were financed and constructed using the turnover, tax revenue, and

employment that the stamp scrip generated. Over 200 townships in Austria began to try and emulate this as of June 1933, prompting the Central Bank of Austria to assert its monopoly rights on the issue of currency, and effectively outlaw "emergency currency". Once again Wörgl's unemployment rate rose to 30% [Boyle, 2002][Lietaer, 2001]. This phenomenon was to become known as the "Wörgl Experiment" and was watched closely by the Great Depression's most well-known economists, John Maynard Keynes and Irving Fisher, who would later both mention the "Wörgl Experiment" as a proof of concept for the Silvio Gesell promoted use of a demurrage charge, or "negative interest currency" [Boyle, 2002][Lietaer, 2001].

The Swiss WIR

Another experiment of the global depression of the 1930's was conducted in 1934 in Zurich, Switzerland for the creation of a community currency for individuals and small-business people. This currency called "Wirtschaftsring-Genossenschaft" roughly translated to "economic mutual support circle" and simply called a "WIR" credit, was formed initially as a test of Silvio Gesell's theories among a group of 16 people and was formatted as a mutual credit exchange system. The system is still in existence today with a reported high of 80,000 members spread across the country. The expansion has led to the creation of a central WIR bank with 6 accompanying regional offices throughout Switzerland [Lietaer, 2001].

The WIR credit is tradable in parity to the Swiss Franc at one to one. The WIR Bank has since 1952 diverted away from a strong connection to Gesell, which has made the opportunity for its monetary policy to include interest on money lending, though at a nationwide low rate of 1.75%. In this manner the WIR system functions in two ways:

1) a WIR credit-debit is created at the trade of a good or service between members. This in many ways functions as mutual credit system similar to LETS.

2) WIR can be issued by the WIR bank in the form of a loan. Subsequent repayment of the loan automatically then removes the WIR from circulation [Lietaer, 2001].

Total turnover has grown from 196 million Swiss Francs (CHF) in 1973 to over 2.5 billion CHF by 1994. This however has fallen since to average at approximately 1.7 billion CHF annually [Lietaer, 2001][Stodder, 2000; 2005].

New data [Stodder, 2000; 2005] has also shown that WIR membership, is in a counter-cyclic balance with the rest of the Swiss economy. When GDP rises and unemployment falls, WIR membership declines. However when GDP falls and unemployment rises, WIR membership increases. This has been construed to demonstrate the stabilization of the Swiss economy that WIR contributes to [Studer, 2000].

3.4.2 From Eco-villages to Sustainable Consumption

The Findhorn Eco-village

The community of Findhorn eco-village consisting of around 450 individuals located near the village of Findhorn in Moray, Scotland, employs an example of a community currency that has been shown to facilitate development in the community and is part and parcel with maintaining circulation of money within the community that has a tangible turnover. The "Eko", the name given to the currency is exchangeable in parity with the national currency of British Pound Sterling as 1 to 1. The currency has been distributed by Ekopia, a local organization that is charged with the collection and distribution of community savings for relevant development projects. So far there have been two issuing installments of 18,500 Ekos, and later 20,000 Ekos, the first installment of which has been estimated to have led to a £150,000 turnover in its first year alone, which is nearly 10 full spending cycles. This sort of recirculation of currency has prevented a substantial leaking of purchasing power from the community to the external economy [Dawson, 2004].

Ekopia was initially formed by a grouping of 220 individuals investing £225,000 in a co-ownership led buyout of the community store known as the Phoenix shop. Further shares have been raised to fund social projects such as support of the Findhorn Foundation and

an educational institution known as the Newbold house. The money was collected in the form of ownership shares which have led to significant returns to shareholders. It has been estimated that for every £500 share invested by an individual, they receive £100 annually in dividends, compared with £10 they would receive in interest from a standard commercial bank. Further financing is underway to help secure wind turbines, and affordable eco-housing. The Eko purchased from Ekopia using pounds sterling also acts to fund low interest loans to businesses within the community, creating room for growth encouraged from the inside of the community. A study undertaken by the Moray, Badenoch, and Strathspey Enterpirse into the economic impact of the Findhorn eco-village on Northern Scotland and have found that the community generates approximately 400 jobs and over £5 million in business annually [Dawson, 2004].

Provision:

Reliance on locally produced food is a central aim of the people of Findhorn Eco-village. Currently agricultural projects that provide food to the community consist of a cooperative community organization known as Earthshare, who in cooperation with Cullerne Garden (market garden operated by the Findhorn Foundation) operate a 25 acre temperate vegetable garden to purportedly provide a major portion of the community's desired temperate vegetables as well as providing produce to an estimated 140 households. Dairy, meat, and eggs are supplied by the nearby 95 acre farm of Wester Lawrenceton [ecovillagefindhorn.com].

Ekopia as a management coordinator for community investments, raised in cooperation with other community investors £600,000 by distributing ownership shares and providing loans in 2002 for the formation of a wind park that installed 3 additional wind turbines to the single turbine that had been in operation since 1986. The capacity of the 4 wind turbines amounts to 750 kilowatts, providing the community of Findhorn Eco-village with enough electricity to be a net exporter of electricity to the grid [ekopia.org]. The community boasts the local construction of 61 "ecological buildings", that endeavor to follow the concepts of passive solar design, inclusion of solar water heating systems, and

highly effective insulation materials as well as a district heating system [ecovillagefindhorn.com]

Damanhur Ecovillage

Nestled in the alpine foothills of the Piedmont region in northern Italy, Damanhur is a confederated eco-village consisting of over 1000 individuals. The people of this community have chosen to invest their money into a real-estate cooperative, that takes on in many ways the role of a bank whereby invested savings are used to finance the purchase of land, and the construction of accommodations, offices, and businesses in the community, and now provides low interest loans for the development of business opportunities in the community. A complementary currency is in use, known as the "Credito" which is exchangeable in parity with the Euro on a one to one basis, though all internal transactions are undertaken using solely the Credito [Dawson, 2004][damanhur.org] Currently a network of over 2000 people and 100 business currently use the Credito on site or in the wider group of supporting participants and organizations [damanhur.org]. At the end of each year, the real estate cooperative undertakes a study to asses which outside supplies and services still need to be brought into the community to keep it functioning, and then takes a step further by identifying ways in which self-sufficiency can be enhanced by incorporating those goods and services into the community in the future [Dawson, 2004].

A current iteration rising from use of the Credito has been the formation of *Damanhur Economia Sostenibile*, or DES, which serves as a "Credit Building Society" a financial institution for the investment of members savings into social and ethical projects including development of organic agriculture, renewable energy, arts, education, and others [damanhur.org].

Provision:

Food self-sufficiency is also a stated goal of Damanhur and to that aim it claims to be currently raising up to 50% of its consumed food needs on site, including the raising of livestock, fish farming, dairy and egg production, the cultivation of vegetables and fruits,

collection of honey, and the production of olive oil and wine. Energy independence and security is another major concern for the citizens of Damanhur and to that end the following estimations have been made of sources of energy for internal production within the eco-village:

- 70% of hot water demand for bathrooms is being produced by solar water heating systems.
- 35% of electricity demand is being provided by photo-voltaic systems and small hydro-electric turbines.
- 90% of heating demand is being met using sustainably harvested wood from the local forest enhancement projects.

[damanhur.org]

The NU Spaarpas Green Loyalty Pilot

A complementary currency reward scheme was initiated in a pilot by the Rotterdam Municipal Authority in the Netherlands in 2002 to test the possible change in habits and provision that a reward scheme for desired practices had on meeting Local Agenda 21 goals of reducing landfill waste, the promotion of the use of public transport and raising awareness about environmental issues and sustainable consumption practices. This was formatted into the NU Spaarpas card [nuspaarpas.nl][Seyfang, 2006].

The NU-card has been likened to a "green-loyalty" scheme of complementary currency, where participants earn "points" for pre-designated practices including waste and recycling separation, utilization of public transport, or shopping locally. Additional points were rewarded by purchasing "green" or "ethical" items such as organic produce, fair trade goods, recycled products, rentals, and repairs. The points then have the potential to be redeemed for more sustainable goods, including more public transport passes, movie tickets, (or other such goods or services where the marginal cost is zero or next to zero for the additional unit) or can be donated to charity [nuspaarpas.nl][Seyfang, 2006].
The NU-card program was run as a pilot project from May 2002 to October 2003, in this time 10,000 households used the card with 100 shops participating with a total of 1.5 million points issued. The limited range of scale and time for the pilot was unable to

measure the appreciable affect the card had on changing overall consumption practices, though a detailed survey found that at least 5% of respondents have since changed their habits (separating waste, buying organics, and purchasing second-hand items) because of the reward nature of the program. One appreciable affect was the general increase in knowledge of the shop owners about their products but left no aggregate change in provision of products [nuspaarpas.nl][Seyfang, 2006].

3.4.3 Community Currency, Regional and Nontraditional

Ithaca, New York

The stated mission goal of Ithaca HOURs is: "Ithaca Hours is a local currency system that promotes local economic strength and community reliance that will support economic and social justice, ecology, community participation, and human aspirations" [Glover, 2010][ithacahours.org].

The oldest and longest running community currency project in the United States called Ithaca HOURS, or colloquially known as simply, "HOURS" were developed by the community activist Paul Glover in the university town of Ithaca in up-state New York in 1991. He was then responding to the economic recession of 1991 especially in this more traditionally economically depressed region of the state and created the concept of the hour note, which represented one hour of labor or $10 USD. This money is a paper fiat currency exchanged in a complimentary style with national currency by participants of the program, with currently over 1300 members, and accepted either in complementary form accompanying national currency or as full payment for goods or services. In addition, no interest loans are offered in Ithaca HOURs for business projects to spur local economic development [Glover, 2010]. One of the largest single loans of its kind world-wide was made using wholly local currency (3000 Ithaca HOURs or $30000 USD) for the start-up of a local credit union. By 1996, the overall turnover equalled more than $1.5

million USD. [Nieves, 1996] Local grants for non-profit organizations in HOURS have also been made, in total as of 2000 reaching nearly $10000 USD [Glover, 2010].

Ithaca HOURs were dispersed initially by Paul Glover, who operated and managed the organization at the outset. Since, Glover has taken an advisory role, and the "Ithaca HOURs Reserve Board" makes collective decisions for distribution. Ithaca HOURs enter the local money supply, when a willing participant known as a "backer" (individual, or business) for the price of $10 USD or one Ithaca HOUR signs up or renews their yearly membership. In receipt of this, the "backer" receives two Ithaca HOURs. To be a published "backer" there is an additional nominal fee to advertise one's good or service in a published directory, that can be made in either Ithaca HOURs or dollars USD [Glover, 2010][ithacahours.org].

Ithaca HOURs and Health Care:

There are currently over 40 listings for health care related services including, alternative medicine, chiropractic, birth related support and health, physical therapy, and mental health in the Ithaca HOURs directory of published backers, who will accept partial to full payment for their services or products using Ithaca HOURs, including a nearby hospital [Glover, 2010][ithacahealth.org].

In 1997 Paul Glover, creator of Ithaca HOURs led an organization of Ithaca community residents for the creation of the Ithaca Health Alliance (IHA). The IHA has the stated goal, "*...to facilitate access to health care for all, with a focus on the needs of the un- and underinsured. We strive to provide access to health care based on need, not on ability to pay, where the talent and generosity of our community come together via a variety of Ithaca Health Alliance programs.*" It is a community backed organization that is funded by member donations and charitable grants to provide sliding scale coverage based on ability to pay. Currently the membership donation is set at $100 USD in which a quarter (25%) of the total price is payable in Ithaca HOURS (2.5 Ithaca HOURS) [Glover, 2010]. Currently 150 health care practitioners located around Tompkins County (of which Ithaca is a part) offer 5 to 10 percent discounts on their regular fees to IHA members. In

addition, IHA runs a number of educational health services for the broader community as a whole [Glover, 2010][ithacahealth.org].

The IHA has since 2006 opened and operated a free integrated health care clinic known as the Ithaca Free Clinic (IFC) to again help "...*the under and uninsured*". Funding for the clinic comes primarily from grants and donations and was made possible from the savings accrued over 8 years since the start-up of the IHA. The IFC is staffed mainly by volunteers including administrative personnel as well as conventional and alternative medicine practitioners, who have invested a total of over 1700 hours of voluntary time and have treated over 4000 visitors since it opened [ithacahealth.org].

Curitiba, Brazil

In essence, the Brazilian city of Curitiba has two separate and distinct types of complementary currencies that work in concert to have contributed to giving this city a faster growth in standard economic measurement, and social and environmental well-being, than that of its own state of Panará, and indeed the entire country of Brazil. The population growth has increased since 1942 from 120,000 residents to 2.3 million as of 1997, and 3.2 million as of 2006. The GDP of Curitiba between 1975 and 1995 grew 75% faster than that of the state of Panará, and 48% faster than that of Brazil, while in just two years between 1993 and 1995 GDP growth was measured to be 70% faster than that of Brazil. Even with a faster internal immigration rate than that of Brazil on the whole Curitiba's GDP per capita grew 45% faster than the rest of the country. Currently residents of Curitiba have a 66% higher per capita income than the rest of Brazil [Lietaer, 2001] [Curitiba, 2010].

The two types of complementary currencies are not the typically understood concept of currencies, but none the less they function in the same way as currencies, facilitating trade to enhance livelihoods and are presented here.

"Garbage Which is not Garbage"

For Jaime Lerner, mayor of Curitiba starting 1971, one of the major issues was the piling up of garbage in the favelas, the makeshift housing lining the outskirts of the city. Garbage trucks could not fit through the narrow streets of the favelas so instead large garbage bins including recycling receptacles for paper, plastic, glass, and biodegradable material were placed at the edge of the favelas. Residents who bring pre-sorted garbage are given a bus token. This bus token is important because it offers residents a means of transportation into the city where most of the jobs are located. In parallel a school-based garbage collection program rewards pre-sorted garbage with notebooks for the poorer students. This had the effect that the favelas were quickly cleared of garbage by its residents [Lietaer, 2001].

As of 2001, 70% of all Curitiba households participate in this program. Over 60 of the poorest favelas earned a million tokens and 1200 tons of food, for the trading of 11000 tons of garbage. Over 100 schools have earned nearly 2 million notebooks for the exchange of 200 tons of garbage. In essence this is to say that garbage, is a sort of currency, whose value can be traded for the facilitation of needs, like that of transportation that provides jobs, and the enhancement of education. In addition the recycling of paper in curitiba through this program is responsible for saving nearly 1200 trees daily [Lietaer, 2001].

The garbage exchange has been paramount to the development and reliance on the bus rapid transit system that has been a model to other cities across the globe. Nearly 85% of the population utilizes this public transit system daily. 1 out of 4 persons using the transit system own cars but prefers not to use them for transport into the city [Lietaer, 2001] [CNN, 2000].

Sol Criado "Created Space" Trading

The city of Curitiba employs a unique technique for its zoning and development planning that generates green public spaces and the restoration of cultural areas, landmarks, and heritage buildings, at small cost to the municipality. The Sol Criado is a market

facilitation mechanism organized by the city that in many respects mirrors the carbon credit cap and trade mechanisms in use today, which are in essence a complementary currency all their own.

The right to build in terms of space permitted by the city for private development projects has certain allowances and limits. This translates into a zoning plan that has permitted space allowance and maximum space allowance. For example a plan for a building project in a particular zoning area may have a permitted allowance of "10 floors" (as a consequence of the ground plan which permits a certain number of square meters) with a maximum allowance of "15 floors". In order to obtain the right to build to the maximum of 15, the project developer has to "purchase" the extra "5 floors" (or an equivalent amount of square meters of space) from a pre-existing structure or area that is using less than its permitted allowance of space. The distinction is that this purchasing can only be done from buildings and areas that have not used up to the permitted allowance of space and who are in need of refurbishment or restoration as identified by the city [Lietaer, 2001].

The effect is that the money used to purchase the rights for the building project to reach the maximum allowance, can then be used for the restoration or refurbishment of the building or area, where the city's costs are only divested in the facilitation of connecting the demand for space with those projects able to benefit from unused space. This has led also to the construction of protected green areas, and the development of some social housing projects in addition, this has led to the development of 28 different parks and wooded areas in the city as of 2001 and contributes to an average of 52 square meters of nature per city inhabitant, which is 4 square meters more than the United Nations ideal standard of 48 square meters per city inhabitant [Lietaer, 2001].

Meta-currency

Meta-currency is the open source platform for an open source economy. It's open rules, identity, transport and decentralized data will provide the infrastructure upon which an

internet empowered peer to peer (p2p) myriad of currencies economy will emerge. It's currently in development.

- Open Identity: Create, manage and own your identity in a trustworthy manner, independent of any central authority.
- Open Rules: Know the rules of any currency you participate in and see when they change.
- Open Transport: A protocol to enable a participant to transact with any other participant and a currency to interact with any other currency.
- Open Data: The ability to share, decentralize and distribute data (like your account balance) and ensure its integrity and privacy… also, to allow you to be a reliable authority of your own data. (You can represent your own accounts, and I can validate your data.)

[metacurrency.org]

Any two parties with internet access and/or cell-phones will be able to exchange value directly immediately and for free using this system.

Chapter 4: Discussion

4.1 Evaluating Complementary Currencies' Effect on Sustainability

The following diagram is based on the work of Gill Seyfang [Seyfang, 2006] when evaluating sustainability of three systems: LETS, time banks, and NU Spaarpas. That data has been incorporated into a diagram incorporating the original criteria of sustainability defined by Gill Seyfang as part of a New Economics (NEF) perspective on sustainability [[Seyfang, 2006]:

"*Localisation*: strengthening local economies can occur through increasing the economic multiplier (the number of times money changes hands before leaving an area), which in turn occurs as a by-product of import-substitution or local provisioning."
"*Reducing Ecological Footprints*: cutting material consumption and waste levels can be achieved by through recycling, changing consumption patterns to cut demand, sharing facilities and resources, etc."
"*Community-building*: sustainable communities are robust, resilient, inclusive and diverse. Overcoming social exclusion, nurturing social capital, and developing active citizenship within participative communities are key aspects of this."
"*Collective action*: this covers both acting collectively to influence decisions and deliver services, and also addressing questions of institutional consumption."
"*Building new social institutions*: creating new social and economic institutions – alternative systems of provision - which are based upon different conceptions of wealth, progress, value, etc, and through these allow people to behave as ecological citizens."
The new data set discussions come from the case studies presented in the previous analysis section. By combining them in this manner, trends are more easily discernible across complementary currency types and examples.

Figure 6: Evaluation Complementary Currencies' effect on Sustainability

↑ = Positive Effect ↕ = Possible Effect ↓ = Little to No Effect

	Localization	**Reducing Ecological Footprint**	**Community Building**	**Collective Action**	**New Social Institutions**
LETS	↑ Economic tool, multiplier affect on circulation of local wealth, employment and self-reliance.	↕ Reduces some resource use: sharing of facilities, recycling, localizing cuts transport costs.	↑ Large social and community benefits, boosting social cohesion and inclusion.	↓ Individualistic tool.	↑ Minimization of wage disparities. Possibility to value non-market work. Abundant medium of exchange. Localized monetary design.
Time Banks	↓ Already localized, no net localization.	↕ Concentration on services, not material consumption, possible developments for rewarding recycling.	↑ Large social and community benefits, boosting social cohesion and inclusion.	↑ Promoted by central authorities for capacity building of the voluntary sector for the delivery of public services.	↑ Central principle of valuing all types of work equally, rewarding unpaid community efforts. Reciprocity and mutuality.
Wörgl	↑ Localized format (stamp scrip) that was shown to have a massive multiplier effect on local commerce and employment.	↕ Not designed to incentivize, though evidence of planting of trees and afforestation projects.	↓ individualistic tool to facilitate commerce and enhance employment.	↑ Distributed by central authority for the creation of public works and goods.	↑ Lack of scarce currency not necessary to enhance commerce and employment.
WIR	↕ Designed to facilitate local trade, but has since expanded to all of Switzerland.	↕ Some evidence of recycling through trade and exchange	↕ Some connection of individuals , but overall a largely individualistic endeavor to facilitate trade.	↓ Individualistic tool. Centralized decision-making for dispersement of loans.	↑ Stabilization of Swiss economy over the long term, opportunities for individuals and small to medium businesses.
Findhorn	↑ Localized format (Eko scrip). Possibly increases multiplier effect for some types of commerce.	↑ Has been used as funding source for the construction of zero-carbon energy projects and for forwarding ideals of an eco-village	↑ Large social and community benefits, boosting social cohesion and inclusion.	↑ Dispersed investments using community funds (Ekopia) for projects that benefit the entire community.	↑ Democratic decision-making (share voting) tied to economic means for the enhancement of the community.

		concept.			

Figure 6 *Continued*: Evaluation of Sustainability for Complementary Currencies

	Localization	**Reducing Ecological Footprint**	**Community Building**	**Collective Action**	**New Social Institutions**
Damanhur	↑ Localized format (Credíto scrip). Circulation boundaries. Possibly increases multiplier effect for some types of commerce.	↑ Used to forward the ideal of the eco-village concept in line with sustainable goals. Funding source for projects that forward these goals.	↑ Large social and community benefits, boosting social cohesion and inclusion.	↑ Institution for investment (DES) in community projects that benefit the community.	↑ Community awareness put towards the realization of a common ideal.
NU-Spaarpas	↑ Rewards buying from local businesses.	↑ Incentivizes recycling, public transport, buying local, organic, and fair trade products, with room for energy efficiency.	↓ Individualistic tool.	↕ Individualistic tool, but promoted by local government. Influences public sector action in transport and waste.	↑ Points systems adjusts relative prices to incentivize sustainable consumption. Anticipates internalization of social and environmental costs and benefits.
Ithaca HOURs	↑ Localized format (Ithaca HOURs). Circulation boundaries. Possibly increases multiplier effect for some types of commerce.	↕ Transport costs cut by some local production. Supports some localized agricultural production (bioregionalism).	↑ Large social and community benefits, boosting social cohesion and inclusion.	↕ Individualistic tool, but evidence of social awareness included in awarding of grants and zero-interest loans.	↑ Raises social consciousness for connected issues. Led to formation of (IHA).
Curitiba	↑ Local format (bus tokens, notebooks, *Sol Criado*). Circulation Boundaries.	↑ Massive reduction of open garbage dumps with increased recycling. Public transportation development. Afforestation, land and nature preserves, green public space.	↕ Individualistic tool, but for the betterment of public health and public spaces.	↑ Centrally promoted and organized to incentivize individual action that collectively is for public benefit.	↑ Reduction in municipal costs for the provision of services, with focus on increased public health and egalitarianism in the development of public space.
Conventional bank-debt scarce national or regional currency	↓ Liquid with centralizing tendencies. Centralized distribution. Divorce of	↓ Externalizes environmental degradation and resource depletion, as movement towards efficient	↓ Valued in the formal economy rather than the informal economy including devaluation of non-	↓ individualistic tool, based on scarce supply created by interest which encourages	↓ Current mainstream social institution.

	production and consumption practices.	allocation.	market community systems that support the formal economy.	hoarding (store of value).	

Whether an evaluated currency in the diagram meets the sustainability criteria will be in large part due to its design and purpose for use. Across these presented currencies there will also exist a variance or disparity between the initial design or stated purpose of the currency and the actuality or success of it fulfilling its design parameters or purpose: these will be explored further here.

4.1.1 WIR and Macroeconomic Stability

While the WIR Bank system is more focused on trade facilitation in complement to national internal trade and commerce and less so on developing localized networks, its stabilization affect on the Swiss economy is a significant presentiment for understanding the nature of resiliency. This resiliency benefits not only the WIR participants but the wider Swiss economy as a whole.

4.1.2 The Eco-village: Currency in Cohesion

Perhaps the most successful examples of complementary currencies demonstrated by meeting the criteria above are those used by the eco-villages of Findhorn and Damanhur. The currencies' successful integration is in large part due to the support of the ideals of furthering sustainability and self-sufficiency which is the major focus and thematic binding that ties each individual community together. In this way the purpose is inseparable from the result regardless of whether the issued currency is merely a fiat currency or actually dramatically increases the economic multiplier.

The desire to be self-sufficient translates not just into their current provision of goods and services in the community, but translates into the fabric of the social-cultural and economic realities of the community. The homogeneity of values, related to ecological,

economic, and social independence, help facilitate the use of their own individual community currencies. This is to say that the success of the currency has to do in large part with the cohesion of their communities and the fundamental framework that it is built on. In this way the currency represents much more than economic potential of trade, but is a symbol for the reciprocal exchange of value of belonging to the community; it is the spirit of community in commodity form.

4.1.3 Ithaca HOURs and Wörgl Stamp Scrip: Strengths and Weaknesses

Not every human community possesses the type of cohesion seen in an eco-village, or perhaps is rather not focused so ardently as in the two examples presented in this project, therefore successful fulfillment of complementary currency's goals will be in large part due to the social and economic capacity of the community to knit their respective currency into the fabric of their community. In this spirit Ithaca, New York has been very successful at knitting their currency to some of these aspects. The mission goal for the currency outlines the enhancement of the economic and social spheres of their city with additional concerns for ecology, and human interaction. By far the most influential impact that Ithaca HOURs has had on Ithaca, is the enhancement of the social sphere. This could also be recognized in the staying power of the currency program, where many other complementary currencies have since withered into disuse in the same operational time frame. The cohesion that the currency lends to the community is in large part a synthesis of value, acting in solidarity for respect to the importance of community interdependence and reliance especially in the face of 'capital flight' that has led to the lower than average income levels of Tompkins County inhabitants. This has also encouraged the valuation of non-market or informal economic activities, boosting inclusion from more typically excluded participants from the formal economy. Resulting cohesion has most likely enabled projects like the Ithaca Health Alliance to be formed. The Ithaca HOUR in this way is connected to the proliferation of an institution of this type to take place though it is not certain whether or not the social capacity building on

the part of the Ithaca HOUR is entirely responsible, though as the Ithaca HOUR did precede the IHA by some 6 years, there is undoubtedly some connection.

There is however some ambiguity as relating to the ability of Ithaca HOURs to contribute to significant economic gains for its participants. This is in large part due to the nature of the currency in circulation. The currency, just like in the Findhorn and Damanhur eco-villages is a fiat currency, meaning that its value is 'created' and not dependent on a standard. So in this case there is the possibility that Ithaca HOURs in actuality does not work in tandem as a complementary currency should, but is actually a replacement for national currency to be used in combination with. This is essentially a 'crowding out' effect to the dollar. In this way the Ithaca HOURs' value is more based on the solidarity of its participants to the commitment of localization and supporting local commerce, rather than generating the coveted multiplier effect that is often quoted as the reason for wanting to create a community currency in the first place. This of course is completely dependent on how the supply of currency is issued.

The supply for the most part in the case of Ithaca, is issued when a new participant signs up to take part, buying in with either dollars or equivalent Ithaca HOURs, with a disbursement of twice that value at the outset, and additionally each year for continued involvement. Buying in of the currency in trade for national currency is one way to establish a standard for the currency, however with an expanding money supply, issues related to the control of the supply and that of its value becomes ever more complicated, as can be attested to by Bernard Lietaer [Lietaer, 2001] co-founder of the Euro, and formerly of the Central Bank of Belgium. Paul Glover even admits that a careful watch must be kept on this issue, and without constant troubleshooting management and dedicated full-time strengthening of networks, the project loses some efficacy. Because there is not a strong link based on the value of Ithaca HOURs over the value of the other (other than the arbitrary fix of one HOUR to $10 USD) the actual multiplier effect for the currency is not measurable by a dollar standard, regardless of the turnover in Ithaca HOURs over a given time span. It can be assumed that there will be some multiple of effect, because of the tenuous link, though the efficacy is not significantly justifiable

without quantifiable empiricism as the currency is not wholly substitutable with national currency.

The reduction of the ecological footprint for the community, is an individual choice more than an institution as part of Ithaca HOURs use. Participants can choose to support, for example the farmer's market, thereby making sure that their money is supporting a means of local production, reducing transport costs associated with food provision (food miles), and products produced using local resources, and may have more transparency over how the food is produced, and how that may lessen environmental degradation elsewhere. In the end, actions to reduce the ecological footprint are made on an individual basis, not at the behest of the Ithaca HOUR itself, though the knowledge base surrounding the concept of localization is enhanced by proliferation of the Ithaca HOUR, increasing awareness about these issues.

Not incompletely different from Ithaca HOURs, the Wörgl Stamp Scrip was an example of a substitutive currency used in a complementary form. It initially had a standard of value, 40000 *schillings.* As it was non-exchangeable outside of Wörgl, it became locally bounded. In this way it is much easer to delineate a pattern of spending and employment generation connected to its use, where the actual economic multiplier effect of circulation can be measured in ratio to amount issued versus turnover. This was assisted in a large way by the inclusion of a demurrage charge requiring the validation of the currency monthly, which increased the frequency of circulation. In simple terms the design was in many ways a storage device for national currency in a secure community format, resisting 'capital flight' (endemic symptom of the global depression of the 1930's) and ensuring that a certain quota of national currency value cannot leave the community once it has arrived. This of course has been labeled as an "emergency currency" and when its success nearly spurred adoption by over 200 other municipalities within one year of inception, Central Banking monopoly rights were quickly asserted to squash this competition.

Regardless of the efficacy of the Wörgl Stamp Scrip in its facilitation of internal commerce and employment, the question must be raised as to just what would happen if the system were adopted in a wide-spread manner, where additional stamp scrip created

comparable storage quotas across the country or region. As the design of this currency was to develop internal commerce and local employment, it is unknown as to what impact this had on local production of goods and services that were normally exportable to other markets. Whether or not the scrip advanced internal production to the detriment of these exportable goods and services is unknown but could have significant influence on intra-trade trends throughout the country. This of course could have a marked effect on a macroeconomic scale for the region in which the stamp scrip schemes proliferate, however the ultimate effects are unknown.

4.1.4 Curitiba: an Integrated Systems Approach

As shown there have been massive benefits towards lessening of ecological footprint through carbon sequestration in creation and expansion of green spaces, city-wide participation in recycling programs that has increased public health, and the encouragement of reliance on mass transit systems. This is of course, part of a wider integrated systems approach to managing several problems while seeking their solution at minimal cost to the municipal body [Lietaer, 2001]. This in some ways demonstrates the potential power that the organization of efforts on a municipal level can have on the outcome of a complementary currency project, and how a well designed system has appreciable benefits in more than one sphere affecting more than one cornerstone of the sustainability triangle.

4.1.5 LETS and Time Banks: What is and What is Possible

Both systems utilize a mutual credit basis as the means of facilitation of trade with LETS focused on goods and some professional services, and Time Banking on community reciprocal services. As per their current designs, they are targeted respectively on facilitation of trade and the facilitation of community participation, with a focus on primarily the economic and social spheres of operation with relatively small impact on reduction of the ecological footprint, though some notable reductions include substitutive import provisioning, reducing associated transport and manufacture contributions towards global warming, as well as encouraging re-use of some items. This is not to say,

that in the future the applicability of these systems could not be adjusted to specifically target reductions in ecological footprints. However the necessary groundswell of public support must also be present in supporting these actions.

As is, LETS and Time Banking are currently adopted by 'niche' groups of people, typically on the periphery of the mainstream economy, and serve to attract participation by members that may be typically excluded from the formal economy [Lieataer, 2001][Seyfang, 2006]. Therefore, adjusting focus from improving livelihoods through the expansion of trade opportunities and social network building would require significant restructuring. This model could, however be adopted by the more financially stable communities as a tool for facilitation of projects that specifically encourage reduction of the ecological footprint. For example the LETS method could be used for the development of a trade market for ecologically conscious and recycled products, such as organic produce and other locally produced products, along with used goods that would normally have no marketability elsewhere. Time Banking could be set up to include or focus volunteerism in activities that specifically reduce ecological footprint, such as carpool exchanges, providing time and labor for the development and operation of community gardening projects or greening projects for public spaces. Labor could also be furnished for service provisions like maintenance of small renewable energy projects and labor for energy efficiency enhancement projects, in homes, businesses, and public buildings.

4.1.6 NU Spaarpas and Integrated Currency Systems

The essential question to be answered in anticipation of a more widely adopted program of this sort, is whether the rewards offered by purchasing certain products or engaging in certain actions actually closes the gap between willingness to pay, and ability to pay. The NU Spaarpas program shows potential for a more widely spread adoption than the pilot demonstrated if this sort of reward program could encourage significant changes in habitual consumption patterns, and if it were organized in a way that facilitated spending

of accumulated reward points in a way that would encourage participation by more than those already interested in reducing ecological footprints.
At its inception, the potential rewards were centered on the continuing of sustainable consumption where one could receive 'more' of what they were consuming. If rewards were more widely distributed across businesses and services, it might attract use by the more reluctant community members, or at least enable the reduction in some pricing disparities between products that are produced in a more ecologically conscious or ethical manner, and those other mass produced products that are offered at a lower price.

There is great potential for a system, that is rewards based to be combined with a time banking system to increase the base of possible participants, and to combine more than the niche of environmentally conscious people and those involved in the peripheral non-market economy of service. Finding a common accountancy could encourage active participation from both spheres, whereby a time currency could be used in the same realm as a rewards currency, where there is interchangeability between service credits and loyalty points to support both changes in consumptive and productive habits.
The Commonweal Inc. HeroCard dual payment system pilot in Minneapolis, Minnesota has shown that it is possible to combine payment systems using two type of currencies, US dollars and time service currency for single payments in a variety of settings, where time service currency is distributed to non-profit or service organizations but are redeemable alongside national currency. This system's benefits are three fold:

1) In support of local businesses, it has been used as a way to offload surplus inventories, and increase dollar income for services and goods during off-peak demand periods where the marginal costs are low. Creates loyal customer base, including the marketable recognition as a "community-supporter". Businesses also benefit from the increased service provision in their locality, which can only enhance sales, and reduce costs in payment for missing but necessary services.

2) For Non-profit and service organizations it is a way to attract greater volunteerism by rewarding volunteers, and to stretch time against costs. It raises

awareness about organization's causes and goals adjunct to their participation in the program.

3) For the individual it increases the provision of time spent volunteering and combines it with activity in the formal or mainstream economy. This is a method for encouraging participation by excluded parties from the mainstream economy, whose lack of scarce national currency can be compensated for in the time spent in service to the community [Lietaer, 2001].

In this manner, a payment system using rewards for certain consumption habits and payment for services provided to the community can be intertwined with participation in the mainstream economy, which has the possibility of accomplishing significant enhancements in communities social capacity and economic health, while simultaneously reducing ecological footprint.

Community currencies have been adopted to promote growth and reinvestment in communities. They represent a store of value that is non-exchangeable outside the confines of its operating jurisdiction. This ensures that capital resources owned by individuals in the community as a form of alternative currency can only be traded within the community, thereby promoting local and constant re-circulation and spurring economic and social development. This creates the opportunity for communities to make their own decisions based on the scale of development created by its own currency. The opportunities for community decision making processes to evolve to more democratic means, demonstrate the power for community held values to be furthered, both in choice of where to distribute community funds, and what to distribute them for. This represents a foundation on which communities have an opportunity to build and grow in sustainable ways that further leave their susceptibility to shocks based on the availability or scarcity of national currencies behind. [Hallsmith et al., 2006]

4.2 Value Exchange Properties and Systemic Discussion

4.2.1 Co-Productive State vs. Welfare State

'An invasive state disrupts the voluntary bonds between people, linking them upwards to the government rather than sideways to each other.'
-- Jesse Norman - *Compassionate Conservatism*

Co-production is a concept that removes the distinction between provider and user. "Instead, people pool different kinds of knowledge and skills, based on lived experience and professional learning, and work together to co-produce well-being" [Coote et al. 2010]. It re-engages the people who are merely kept afloat on government assistance and empowers them to take part in their community. This increases the self esteem and empowers those involved as they are actively contributing, not simply receiving. By facilitating co-productive services, government becomes a broker of services, not a provider. The long term economic feasibility of the welfare state has been called into question [Pestoff, 2007], so exploring alternatives may not be just beneficial, but necessary.

4.2.2 Interest vs. Demurrage

The financial system we have used for nearly 300 years now has included interest. This has been a part of an extremely successful capitalist system because it provided the capital to banks necessary to efficiently facilitate exchange. However, as we have seen, interest is also responsible for the growth imperative. This is due to the fact that money is centrally issued and because a governing body produces it (or enables banks to produce

it), a tax to manage it is added in the form of interest. As we have also seen, because of the internet, there is also no longer need for an intermediate party to facilitate exchange. "*Under our current system it makes sense to cut down trees and put the money in the bank; the money in the bank will grow faster than trees. It makes sense to "save" money by building poorly insulated houses because the discounted cost of the extra energy over the lifetime of the house is cheaper than insulating*." - *Bernard Lietaer*

About a century ago, Silvio Gesell wrote about a concept called Demurrage [Gesell, 1890]. This money depreciates over time, instead of appreciates (like interest). This is because money took the form of a physical good (e.g. grain) which was typically stored in silos. So a typical person would drop their grain off at a silo and get a receipt which represented it's worth. If they wanted to turn the receipt back into grain at some point, they would get less grain than what was deposited due to rats, spoil, etc. In demurrage systems, people would only use money as a medium of exchange, but not as a store for value. That would create work, because it would encourage circulation, and it would invert the short-term incentive system. Instead of cutting trees down to put the money in the bank, you would want to invest your money in living trees or installing insulation in your house. This change ensures money becomes worth less over time and the real economy is valued accurately against money.

4.2.3 Complementary Resiliency

The hypothetical diagrams below show two distinctly different types of incomes and expenditures. The diagram at the top is indicative of a full time worker paid in national currency. This user has a full time job which provides them with enough national currency to provide everything they need, but they choose to engage in community currency commerce for social reasons or otherwise. They do not choose to earn community currency over national currency as it will not provide the same standard of traditional western lifestyle that a community currency would.

Figure 7: Full Time National Currency/ Community Currency User:

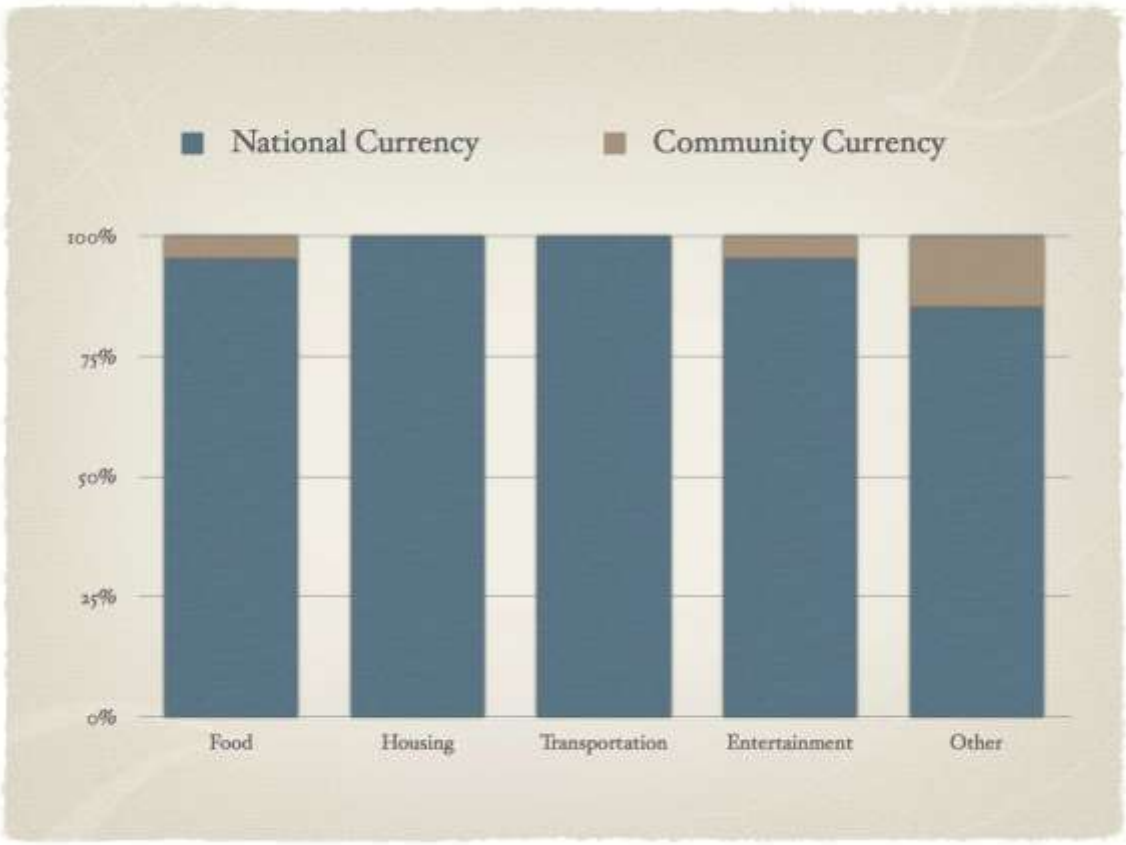
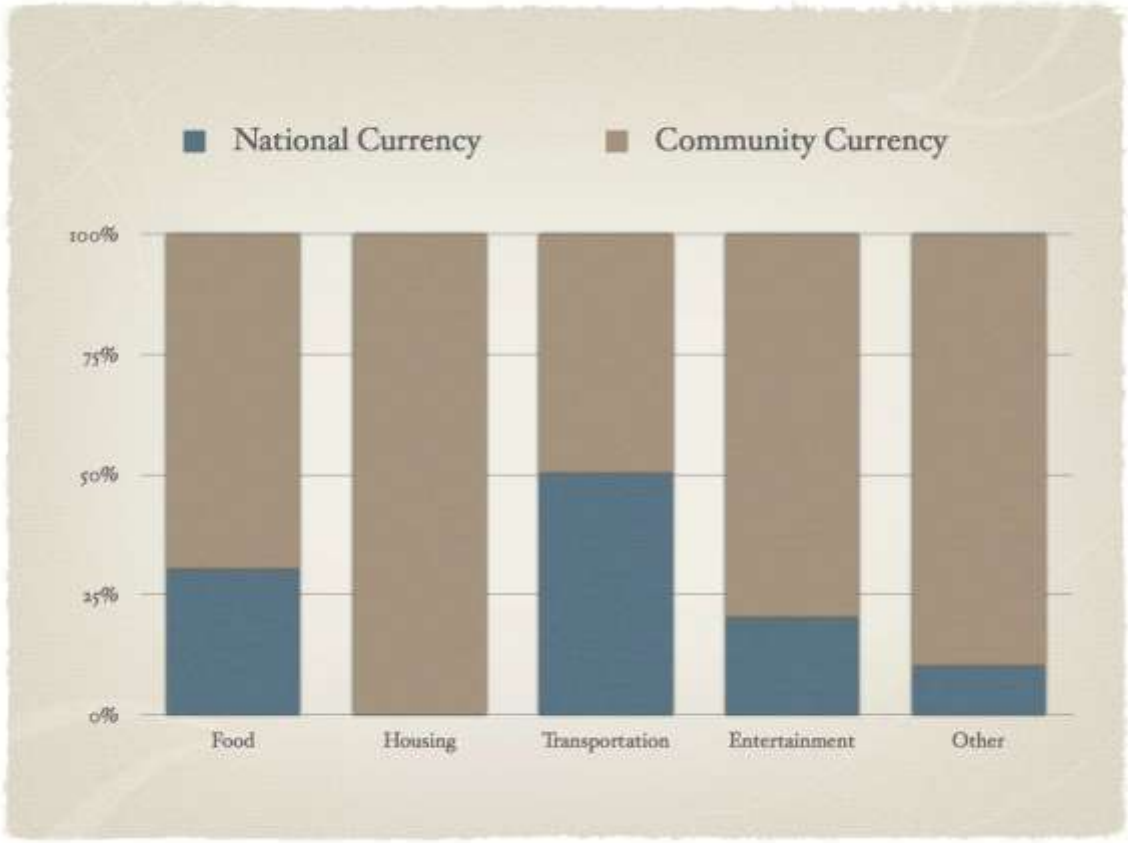


Figure 8 shows a typical income for a community currency user that is dependent on community currency because they are unable to get a traditional, full time job. By utilizing co-production they are able to maintain community currency employment and are therefore able to provide what they need to live a sufficient life. They might make the rest of their national currency through a part time job, savings account, hybrid employment compensation etc.

Figure 8: Community Currency Dependent User



As shown, community currency and national currency play complementary roles. National currency provides the financial specialization empowerment necessary for highly complex goods and services to be facilitated. Complementary currency provides an ever present, resilient, local, basic services framework.

Complementary currency can be utilized by those who are left out of the traditional employment loop to provide basic needs, but they will still rely to some extent on national currency for goods and services that are only produced from highly specialized regional, national or worldwide companies. For those who have full time national currency jobs, it can be used as a social tool to facilitate community participation and interaction. This interaction between the currencies creates a natural resiliency to shock

for both communities and individuals. For individuals, the alternative currency is there if they lose their job. For communities, this currency is there if more national currency flows out of the community than flows in. If something happens to the markets nationally or internationally, the community currency is there to ensure that local generalized, basic service commerce is facilitated regardless of that external shock. The specialized markets and jobs that are powered by national currency still take a hit during those times, but the basic services powered by community currency are unaffected and therefore able to keep communities afloat during these shocks. Once the shocks pass, the communities are in a better position to facilitate national currency commerce because the lattice provided by basic services was always there to keep communities and the people living in them propped up.

4.2.3 Profit Motive vs. Co-Operative Sufficiency

The labor intensive investment necessary for successful small scale agricultural production can be a boon for a community that may have sufficient labor capital without the scarce national currency investment capital to handle production costs and wages of a local agricultural business. Community Currency has the opportunity to encourage the development of local agriculture cooperatives, by facilitating transactions and measures of trade value and labor hours in a system that doesn't depend on scarce national currency or a profit-motive. Profit-motive is what drives large-scale industrial national currency food production. The cost of the profit motive is a focus on cheap labor, materials and efficiency to return a profit to its stockholders at the expense of labor and consumers as well [Altieri, 2001]. The advantage co-operative community agricultural projects is they only have to pay for the land, labor & input and are not forced to consider stock holders growth concerns. By removing the profit requirement, the focus is shifted to sufficiency. This allows for non-conventional metrics like quality production & fairly compensated local labor.

4.2.4 Legal Fallacies

As Shown in the following Figure 9, currencies possess many attributes that make them similar to languages. "*Currencies are symbol sets, and can be defined as a linguistic phenomenon. A lot of people mistakenly think money is some thing of value. Currencies are symbolic, and therefore in the domain of language.... Nobody owns English, it's in a higher domain, the commons. If someone could own English, that would be a big problem, severely hampering communication.*" [Rosenblith 2010].

Given this framework, one is left to ponder the effect that outlawing complementary currencies can have on society. What would society look like today if one central authority had a monopoly on the use of language? Where creating new words required central authorities' permission or was even against the law? When framed this way, it's possible to conceive of how limiting our existing exchange structure is and what more open frameworks for value exchange could bring.

Figure 9: Comparison of Language and Currency

	Language	**Currency**
Uses Symbols	**X**	**X**
Communicates	**X**	**X**
Historical Narrative	**X**	**X**
Exchanges Value	**X**	**X**
Exchanges Information	**X**	**X**
Modifies Behavior	**X**	**X**

-Uses Symbols: is something such as an object, picture, written word, sound, or particular mark that represents something else by association, resemblance, or convention.
-Communicates: a process of transferring information from one entity to another.
-Historical narrative: Conveys historical implication or story which can be derived from its use.
-Exchanges value: The process of increasing benefit between two or parties by means of exchange.

-Exchanges information: Information passes between both parties.
-Modifies behavior: Behavioral implications are inherent with it's use. [Rosenblith, 2010}

4.2.5 Taxation, Informal Economy, and Non-market Income

In the Stiglitz report of 2009, one of the conclusions was "*Broaden income measures to non-market activities*". Under current taxation schema however, this is an impossibility due to the fact that non market activities are not reported and informal economic work is unaccounted for. If they were reported, they would be taxable. Many non market activities are simply not possible if they are taxed under existing scenarios. For example, if a couple sometimes employ a teenager to look after their small children while they go out for an evening on the town - if that wage was taxed (at the same rate as a traditional wage), it would increase the standard rate charged for the service and therefore reduce the amount of opportunities for the babysitter to be paid and for the couple to enjoy some time out. Another example might be an IT person out of work. If they are unable to find a job, they might accept computer repair jobs for locals in the area of their residence, or some other work that might be connected to a skill set they have, however taxation on those services also increases the price and reduces the overall potential capacity for participation in the informal economy. Considering the fact that between 5-10% of any western countries' workforce is unemployed and is therefore left out of this "paid" economy at any given time. The result are threefold:

1) That they place significant burden on national tax revenue by requiring a stipend from the government to pay them until they can find work again. This can create a dependence on that stipend from the government where the choice between low income employment and welfare often results in a choice of the latter [Noordhoof, 2008].

2) It is also demoralizing for many who are left out of the traditional employment loop as they cannot support themselves legally in any other method.

3) While out of work (whether temporarily or permanently) the value that they could be bringing to the economy is lost.

If typically informal activities are taxed at significantly lower rates (5-10% instead of 50%+) it ensures that the transaction can be facilitated within the scope of cost effectiveness by ensuring that users are not inhibited from keeping it legal. In terms of tax revenue, there is a net gain here as the informal economy is now formal. By calculating appropriate tax brackets by *employment type* and income bracket a more complete *citizen contribution framework* is made possible.

By implementing complementary currencies, those who are left out of the traditional economy have an opportunity for empowerment and reduced dependence. They are also able to contribute meaningfully in whichever way they *are able*. For example, if a factory floor worker gets into a car accident and is unable to continue his job - he would ordinarily be forced onto unemployment and disability. However, if he were able to serve his community, he could man a phone bank to educate locals on upcoming ballot initiatives, spread the word about local meetings, services offered, etc. He could be paid in local currency, which would provide a *sufficient* income but more importantly allow him to continue to be "employed" and not reliant. The same thing could be said of the elderly. Instead of their productive lives "ending" at retirement age, they can give back what they are able to for as long as they wish - in ways that are simply not possible within the current framework.

Critics of this approach argue that complementary currencies are simply a method of avoiding taxes. This is an over simplification of the issue for a number of reasons:

1. Ledger based currencies (like LETS) have transparent transaction records for everyone to see the type of transaction and the amount. Therefore, implementing a tax on this type of currency is actually much easier than a paper based currency as there is nothing to report, it's all already there.

This ensures two things:
a. There is no artificial scarcity. It is sufficient to ensure that the transaction is facilitated because the currency is created by the transaction, not by a third party independently through debt.
b. Everyone can see the transaction because it is facilitated over the web and displayed publicly, not by hand "illegally". Increasing transparency actually *assists* with the ability to tax incomes based on trade of goods and services.

2. Complementary currencies are usually not utilized by the well off of society, but by those who have been left out of the traditional scarce currency economy. This is due to the fact that scarce currency can buy everything in our society. Local currency is typically only used for basic provision.

In this open data environment, it's quite simple to place limits on the amount of trade exercised between parties. In fact, this is routine for much more difficult to track centrally issued currency, which is traded hand to hand and then reported on at some point in future. With ledger based value exchange all transactions *can* be setup as transparent to a central authority and therefore taxing commerce facilitated by type, amount or otherwise.

4.2.6 On the Evolution of Trust in Exchange

Community Currency is further important as a user generated currency, meaning that the ability of a transaction to be made for a good or service does not depend on apparent lack or abundance of scarce national currency (ability to pay) and instead relies on (in many examples of community currency) the balance or exchange of credit based on user reputation. Reputation is a function of involvement in a community currency program. As competition for scarce money in a market is a policing agent for adherence to the guarantee of future production that a unit of currency represents, reputation is the policing agent for adherence to the promise of production that community currency

represents. This ensures equal and fair participation among its users, as reputation is the measure of whether a transaction will or should be accepted or declined.
Trust is the basis of nearly all money systems in use today. Some countries still back their money with commodities (like gold), but most have removed the material restriction in favor of a purely fiat currency, which not tied to any material of inherent value. Users trust that the central government & banks that issues the money will honor it's worth. They also trust that other users will share the same trust in the central authority. Users of this currency therefore trust that when they accept this money as payment, that it will be worth something when they want to use it. In order to transition from centrally issued, to issued by users directly, it's essential to create a new mechanism for trust.

The next iteration of trust enabled exchange will be digitally birthed. Instead of looking to a central authority to trust, users will look to each other. This concept of trust will take the form of what's called "flows". These flows show who we have transacted with, the amount, the nature, etc to create a digital profile of "how" you are by showing how you work and how you play & consume. This flow profile will therefore become your digital reputation and the basis of which transactions are considered for acceptance. Virtual tribes will emerge that will vouch for your worthiness and will be rated & profiled in the same way as individuals are. This individual and tribal profiling will become the basis upon which algorithms will be developed to automatically accept or deny the majority of transactions. Those that fall into the middle range, will need to be considered manually and will therefore require a value judgment. This is the functionality being enabled at Metacurrency.org. A real world in use example of a portion of this system would be eBay's profile system. Before you pay someone, you want to make sure that the person is trustworthy, so you review their purchase and selling history before making a value judgment regarding whether to move forward with the purchase or not. If you think about it this way, we will be going from an entirely hands off/ no value judgment/ no visible profile/ no transparent flow economy to a world where all of those are in place. Real world lending models [Kiva.com] built on digital trust are out-competing traditional banks in lending to emerging markets [Silver, 2010]. Consider what the economy was like before we had written language. When everyone could share their ideas across space

and time, it changed everything. The change to the next economy will be that large. When people, communities, regions and the world can create their own wealth by creating their own currencies, this will change everything in the same way. No longer is wealth hoarded by the few in a scarce environment. It is created as needed, whenever needed in a personal exchange, so it is always sufficient to achieve the means of exchange and nothing more.

4.2.7 Holistic Measurement

This leads to the idea that growth of communities both in economic and social well-being is dependent on scarce-money resources to affect positive adjustments in standard of living. This however divorces potential production based on market goods and services. This potential production is at the heart of finding ways to maintain positive economic and social growth for communities of individuals, where a scarce money resource, only has the ability to measure value based on standard market goods and services whose production is linked to investment, production, and consumption that may or may not be linked to market decisions and participation of actual community members.

This project takes the view that an evaluation of fiscal resources in a community that consumes products but is decoupled from the production of those products lead to a dependence on the forces of the market, such as expansion, contraction, and failures. Well-being can be enhanced by increasing internal production of some goods and services while reducing import of others. This is at the heart of creating a community currency. It is a means to achieve a stability for communities where the liquidity of scarce-money can dramatically affect well-being and standard of living in the globalization of markets that individuals are attached to but have little influence in.

The use of complimentary currency is a bottom-up rather than top-down strategy for enhancing community well-being. This is a differentiation in the spectrum of socio-political thinking about who is to assume the burden of responsibility for ensuring

welfare and well-being of individuals and by virtue of association, the communities in which they inhabit. A classical social welfare state, is tasked with ensuring supportive development of individuals, and thus the means for doing so is an apportionment of tax-dollars distributed to a government institution to assist in this manner. In many ways this seems the most straight-forward strategy for enhancing individual well-being and is in common practice in many countries today, notably Denmark. This however is a socio-political decision that does not correspond to the business as usual attitude of other major countries like that of the USA. The federalization of states encompassing the USA offers leeway to individual states to make socio-political decisions that rely on voting majority attitudes of inhabitants, though a generally historical perspective has promoted the idea of a hands-off attitude to market structure, and individual liberty. Increasing liberty (a philosophically desirable outcome) in this respect has an inverse relationship with the amount of government control perceived to be present in the everyday lives of its citizens. This has very much to do with the use and distribution of individual scarce-money in the form of taxation. While some states, regions, counties, or cities in the USA may align closer to the welfare state model, evidenced by higher proportional taxes and provision of greater government services, there are just as many if not more of these entities that believe the government should have limited access to their scarce-money and that social well-being is a matter to be handled by individuals rather than adjusted by the state.

In such a regard this is to say that individualism in the USA has seen that the allotment of national or overarching social policies is weaker and less holistic overall compared with the strong support that higher taxation can provide. With a hands-off perspective towards individual scarce money resources and an individualist prevails attitude surmised in the axiomatic knee-jerk response of "pulling oneself up by the boot-straps", community currency is perhaps one of the only options available to a community that is either unwilling or unable to secure social-welfare services that would otherwise be provided by a government institution. Where the provision of a government institution can or will support local economic development, community currency has the same opportunity because they are both essentially a pooling of capital resources. Community currency

however has a more dynamic democratic component to its use in that individual decisions affect the flow of this allotted capital, and are not entirely dependent upon the purview of an institution to do so, where investment decisions are more targeted and less dispersed.

4.2.8 Diversification of Currencies' Effect on Generalization of Provision Systems:

As we have seen, complementary currencies each provide unique benefits by empowering exchange facilitation in different ways. When multiple currencies are used together at the same time, they can fill the gaps inherent in traditional scarce currency exchange. This diversification of currencies therefore proportionally decreases the reliance on highly specialized systems like traditional agriculture, electricity and other traditional infrastructure as the corresponding rise of generalized, decentralized systems emerge in their place. This increased generalization of basic provision systems, does not however, have to result in a corresponding decrease in high tech, non essential systems if the employment hours are reduced, leaving time for more time for diversified livelihoods [Coote et al. 2010].

Generalization of local provision systems is not necessarily in conflict with specialization of production based on comparative advantage in international trade theory. Specialization in comparative advantage scenarios leads to efficiency of the market, based on the assumption that the market is complete, and each contributor faces perfect competition. This however is skewed, as the market is incomplete on a global scale, leading to exploitation of resources in markets that exist for some countries and not others. National bank-debt scarce currencies are part of a system, where specialization or diversification is more appropriate to round out the deficiencies in market and currency mechanisms that do not function on a global scale.

4.2.9 Issues Facing Socialized Democracies and Multi-Tiered Currency Systems

In many socialized democracies today with their high rates of taxation (including Denmark) are facing issues which are forcing them to consider cutting some of the programs which have made their countries so successful. The labor force, once educated can easily move elsewhere in the EU or abroad to find more favorable taxation schemes. They also are largely unable to attract skilled labor from abroad for this same issue. The result is that socialized nations are electing conservative leaders to remove these social programs which made these countries, the countries with the highest ratings of well being anywhere in the world [OECD, 2009]. This is sometimes referred to as a "brain drain" or "human capital flight."

The 4 tier complementary currency system outlined by Bernard Lietaer [Lietaer, 2001; 2010] can address these issues by creating tiered taxation schema by geographic location. Under his plan, there are 4 distinct levels of currencies:

1. Global
2. Regional (EU level, North American, Asian etc)
3. National
4. Communal

In order to optimize the facilitation of exchange, the types of currencies used at each region will vary (ledger vs. bank issued etc.) both hierarchically and geographically. This will create both a natural marketplace for currencies to evolve, but also ensure that the right currencies are used for the right situations and locales. As we have seen, there is no single, perfect currency. It will take continual usage & experimentation to find the right *mix* of currencies to ensure optimal value exchange.

In this scenario, currencies and related taxation could be tied to their consumption. By integrating tiers of commerce to tiers of currency, a taxation scheme can be diversified,

which would allow for nations *and communities* to share the burden of socialist programs while providing the flexibility of regional and in fact worldwide citizen's mobility to live where they please. For example, if the burden of social programs like healthcare and lower education was moved from the state to the communal level, this would reduce the taxation required on a national level to provide services like higher education and infrastructure. This is not just decentralization for the sake of itself, but adaptability streamlined to fit the needs of exchange. Compartmentalization does not have to be the dissolution of nation-state power but is instead the distribution of this power across the participating networks, even if only conducted from a financial perspective.

By implementing taxation schemes hierarchically for the regions above based for each currency, programs that were previously impossible (based on agreements or lack therein at the UN) are now funded (recommending a tax structure is not within the scope of this project, the hope here is to merely illuminate the possibility). On the other side, consumers know that when they spend using local currency and are taxed on that currency, that the currency derived will be put back in locally by harnessing the local labor there for government programs. The currency used depends on the distance from the home origination of the company producing the product and the consumer purchasing it. The local bias will emerge organically within these parameters and ensure that people prefer to buy as local as possible *without* restricting access to necessary external goods and services. This will foster resilient, sustainable infrastructure and production as *reliance* on external sources reduces.

Chapter 5: Conclusion

Complementary currencies are not a silver bullet for sustainability. They are however a requirement for enabling a sufficiency, instead of scarcity mindset. This is necessary to empower cooperative instead of competitive mindsets. This will enable us to focus less on acquisition of money itself and more on fulfilling what really matters in our lives. By defining types of currencies across use, the diversification of currencies can be adapted to their most fitting relevance, and can even be combined in transactions to affect the most worthwhile mix of value. This creates greater stability across all tiers as buffers to single points of failure.

Complementary currencies create sustainable, resilient livelihoods for the residents of the community. They encourage commerce to stay local and encourage better food choices for individual health and the environment. By implementing a complementary currency, all members of the community are able to participate in commerce within the community. If more resources are coming into an area than are being exported, this is promoting either an unequal distribution of resources, resource exploitation or both. This local job creation encourages a locally produced, locally consumed ecosystem which reduces the dependence on foreign produced products and currency.

Communities do not require growth to thrive, they require sufficiency. It's up to policy makers to ensure that communities are empowered to meet their needs, not stifled. Before the advent of the internet and mobile devices, more advanced reporting and therefore taxation schemes were simply not feasible. However, this is simply no longer the case.

Empowered by the internet and the ongoing failures of the existing monocultural currency system, person to person value exchange will soon be ubiquitous. The question is not whether open money systems will be adopted or not, but whether governments choose to embrace them. Will governments embrace new forms of value exchange to empower their citizens? Or will their relevance erode because they failed to act in their citizens and the worlds' best interest?

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Glossary

Abundance: The opposite of scarce. Enough to achieve the ends.

Anthropocentric: is either the belief that humans are the central and most significant entities in the universe, or the assessment of reality through an exclusively human perspective

Brain drain: the large-scale emigration of individuals with technical skills or knowledge; it is normally due to conflict, lack of opportunity, political instability, or health risks

Capital Flight: occurs when assets and/or money rapidly flow out of a country, due to an economic event that disturbs investors and causes them to lower their valuation of the assets in that country, or otherwise to lose confidence in its economic strength.

Capacity building: often refers to assistance that is provided to entities, usually societies in developing countries, which have a need to develop a certain skill or competence, or for general upgrading of performance ability.

Centralized currency: Currency issued by a central authority, typically a nation.

Community currency: in its common usage, is a currency not backed by a national government (and not necessarily legal tender), and intended to trade only in a small area

Complementary currency: is a currency that is meant to be used as a complement to another currency, usually a national currency

Co-operative (co-op): is a business organization owned and operated by a group of individuals for their mutual benefit.

Crowding out: is any reduction in private consumption or investment that occurs because of an external effect ie. an increase in government spending

Decentralization: is the process of dispersing decision-making governance closer to the people and/or citizen.

Demurrage: is a cost associated with owning or holding currency. It is sometimes referred to as a carrying cost of money.

Eco-village: are intentional communities with the goal of becoming more socially, economically and ecologically sustainable.

Efficiency: the capacity to process volume

Gross Domestic Product (GDP): is a measure of a country's overall economic output.

Human capital: refers to the stock of competences, knowledge and personality attributes embodied in the ability to perform labor so as to produce economic value.

Industrialization: is the process of social and economic change that transforms a human group from a pre-industrial society into an industrial one.

Interconnectedness: a measure of health as it represents the interdependence of the different facets of the biosphere and how they relate to its functioning in terms of the cycling of biomass and nutrients.

Interest: a fee paid on borrowed assets. It is the price paid for the use of borrowed money, or, money earned by deposited funds.

Multiplier effect: the amount of relative economic change created by the production or spending of a given amount of currency within a given area

Monetary economics: a branch of economics that historically prefigured and remains integrally linked to macroeconomics. It provides a framework for analyzing money in its functions as a medium of exchange, store of value, and unit of account.

Monetary system: anything that is generally accepted as a standard of value and a measure of wealth in a particular country or region

National currency: money is established by government decree. Where fiat money is used as currency, the term fiat currency is used. Today, most national currencies are fiat currencies, including the US dollar, the euro, and all other reserve currencies, and have been since the Nixon Shock of 1971

Natural capital: the extension of the economic notion of capital (manufactured means of production) to goods and services relating to the natural environment

Non-market activities: activities which take place outside the scope of traditional employment, but in many cases still produce a measurable benefit.

Open money: Open money is a means of exchange freely available to all. Any community, any association - indeed, any body - can have their own money. Open money is synonymous with LETS

Peer to peer (p2p): refers to any process enabled between two parties directly without the need of intervention of an intermediary.

Profit motive: is a paradigm in economics that refers to individuals or societies gaining the maximum amount out of the resources they have available to them

Provision: the act of providing necessities.

Resilience: resistance to external shocks, whichever their cause (environmental, financial, political, war, etc)

Scarce currency: A currency which has a finite amount. It is limited physically.

Scarcity: is the fundamental economic problem of having seemingly unlimited human needs and wants, in a world of limited resources. It states that society has insufficient productive resources to fulfill all human wants and needs.

Self sufficiency: the state of not requiring any outside aid, support, or interaction, for survival; it is therefore a type of personal or collective autonomy.

Social capital: refers to connections within and between social networks.

Stock: an aggregate measure of some resource at a particular instance in time

Sufficiency: refers to simply having enough, without excess.

Swadeshi: a successful economic strategy to remove the British Empire from power and improve economic conditions in India through following principles of *swadeshi* (self-sufficiency).

Market economy: economy based on the power of division of labor in which the prices of goods and services are determined in a free price system set by supply and demand.

User generated: refers to anything which is created by users directly. No central authority or intermediary is involved in it's creation.

Usury: Originally meant the charging of interest on loans. This included charging a fee for the use of money, such as at a bureau de change. After interest became acceptable, usury came to mean the interest above the rate allowed by law. In common usage today, the word means the charging of unreasonable or relatively high rates of interest.

World Trade Organization (WTO): designed by its founders to supervise and liberalize international trade.