Natural Capital:
Business as Usual

April 2016
Relationship of Natural Capital (NC) for Biodiversity is based on two factors: the acceptance by NC of the current economic system and the position of NC in the monetary value system.

Economic systems are a combination of surplus energy systems and monetary systems that act as amplifiers, speeding or slowing economic growth.

Our current system has massively speeded up economic growth; it is based on globalized credit, which is the means for delaying payment, servicing the borrowed principal and allowing us to massively scale up our consumption today. This credit/consumption model is detrimental to Biodiversity, as it is based on a constant growth of consumption and credit, effectively an exponential function.

NC joins the globalized credit/consumption economic model, putting forward itself as an asset (stock) for the system and its eco-systems services (flow) as income.
Definition of Natural Capital*

- The term ‘natural capital’ is used to describe the parts of the natural environment that produce benefits of value to people (“wealth”).

Sources:
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### Definitions of Economic Growth (changing definitions)

<table>
<thead>
<tr>
<th></th>
<th>Growth</th>
<th>Components</th>
<th>Formula</th>
</tr>
</thead>
</table>
| Arthur Pigou | Classical Economic Growth (Externalities) | • Land  
• Capital  
• Natural resources  
• Externalities | $FP = f (L,C,N) - E$ |
| Simon Kuznets | Economic Growth (Gross Domestic Product) | • Consumption  
• Investment  
• Government Spending  
• Net Exports | $Y = C + I + G + NX$ |
| William Nordhaus | Green Economic Growth (ISEW)* | • Consumption  
• Capital  
• Externality (environment)  
• Depreciation (nature) | $G = C + C - E - D$ |
| Mike Milken | Current Economic Growth Model | • Financial Technology  
• Real Assets  
• Human Capital  
• Social Capital | $P = F_t \times (RA + HC + SC)$ |
| Clarmond | Internal Model | • Total Primary Energy Surplus  
• Monetary System | Output $= TPES \times MS$ |

**Sources:**

* Index of Sustainable Economic Welfare
What we eat, we wear, our shelter, our communication, our travel is some form of fossil fuel.

Sources:
<table>
<thead>
<tr>
<th></th>
<th>1945-1971</th>
<th>Post-1971</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Money</strong></td>
<td>Gold</td>
<td>HQC (US Treasury)</td>
</tr>
<tr>
<td><strong>Money</strong></td>
<td>USD (backed by Gold)</td>
<td>USD</td>
</tr>
<tr>
<td><strong>Credit</strong></td>
<td>Bank-based</td>
<td>Market-based</td>
</tr>
<tr>
<td><strong>Capital Account</strong></td>
<td>Closed</td>
<td>Open</td>
</tr>
<tr>
<td><strong>Trade</strong></td>
<td>Managed</td>
<td>Global</td>
</tr>
</tbody>
</table>

- International Money: The means of final payment (Reserve)
- Money: The means of domestic settlement
- Credit: The means of delaying payment
- Capital Account: The flow of money
- Trade: The flow of goods and services

Sources:
Humanity aspires to live in a society where all measures of material consumption grows yearly...credit without end.
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Credit, Economic Growth and Biodiversity Loss

Notes:
* Total Credit Debt Market Owed Annually since 1970, not seasonly or inflation adjusted
Gross Domestic Product since 1970, Fiscal years since 1970, not seasonally or inflation adjusted
 Sources:
1. Federal Reserve Economic Data - FRED - St. Louis Fed

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Natural Capital joins the Monetary System

Monetary System

\[ y = x^*e^{rt} \]

- \( x \) as any input
- \( r \) as rate
- \( t \) for time

Credit without end

Credit

More Credit

More and More Credit

More, More, More and More Credit

More, More and More Credit

More, More and More Credit

Natural Capital

\[ P = F_t(MC/FC) \times (RA(NC) + HC + SC) \]

- Natural Capital joins as a participant to current monetary system

Sources:
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### Human vs Nature System

<table>
<thead>
<tr>
<th>Nature</th>
<th>Human</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Real Assets</strong></td>
<td><strong>Energy</strong></td>
</tr>
<tr>
<td><strong>Natural Capital</strong></td>
<td><strong>Energy</strong></td>
</tr>
<tr>
<td><strong>Currency</strong></td>
<td><strong>Energy</strong></td>
</tr>
<tr>
<td><strong>Surplus</strong></td>
<td><strong>Energy</strong></td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td><strong>Energy</strong></td>
</tr>
</tbody>
</table>

- Surplus and availability of Nature and monetary system and nature have different attributes
- NC is dividing the Finite with the Infinite
- The construction of the monetary system matters

**Definition of Money**
- Store of Value
- Unit of Account
- Means of Exchange

**Sources:**
* NCI - Georgina Mace, Natural Capital Monitoring Jan. 12th 2016.*
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Natural Asset Securitization

- NC protocols are framework to make nature relevant, rigorous, replicable, consistent
- How finance reads this is that nature becomes marketable, legal, tradable, standardizable
- Under an NC regime we shall harmonize, homogenize, and finally securitize nature
- Nature becomes simply another asset, fungible, like real estate or any other real (material asset)
- This speeds up process of decline of biodiversity as more debt is issued versus new assets brought into the credit consumption system.
- Balance sheets must balance. New Asset, New Liability

Sources:
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The 25 year NC plan - Outcome

Notes:
* Total Credit Debt Market Owed Annually since 1970, not seasonally or inflation adjusted. Projected growth rate of 4% from 2016.
Sources:
1. Federal Reserve Economic Data - FRED - St. Louis Fed
Nature (externalities) is not being accounted for in our economic statistics: yes, but the answer is not make nature a standardized global asset for securitization, accelerating biodiversities demise.

Green sustainable economy creates trillions of USD of new markets (ecosystem services): it may, but the green economy is still powered by credit & consumption, which need to rise - more credit, more consumption, less biodiversity.

Corporations are thinking about how they impact nature: yes but consumption model is not being challenged, corporations till wish us to buy more - Jevons Paradox*

NC becomes part of the globalized market. Global markets hierarchy trumps NC, it is another asset of the global monetary system. NC, within the credit system, accelerates biodiversity loss.

Fundamental problem with NC, we do not question our current credit/consumption system (that provides a glorious standard of living today) no hard choices for us.

NC, via its logos filled pages, admonishes us to get in line or be left behind.

Sources:
* Technological progress increases the efficiency with which a resource is used (reducing the amount necessary for any one use), but the rate of consumption of that resource rises because of increasing demand. Wikipedia.
If not NC, then what addresses the Big systemic problem of Biodiversity loss:

Let us see how we dealt with past systemic problems:

Healthcare (flow based): most developed countries have a healthcare right - Liability

Education (flow based): most developed countries have an education right - Liability

Monetary system (asset based): gargantuan input of funds to safeguard the monetary system, with minimum hesitation - Liability

Nature (Biodiversity) is not an asset - it is a Liability, and once we accept this obligation, this right, we can address it as we have past systemic solutions
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Current Initiatives underway for Nature as Natural Capital

Sources:
1. “The natural capital myth; or will accounting save the world?” Preliminary thoughts on nature, finance and values by Sian Sullivan
CLARMOND
Carbon Emissions, Oil and Natural Gas

Sources:
1. investing.com
CLARMOND
US Market Sectors

Sources:
1. The Long-term Returns on the Original S&P 500 Firms by Jeremy J. Siegel and Jeremy D. Schwartz

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## Green Designated Bonds

<table>
<thead>
<tr>
<th>Name</th>
<th>Amt Issued</th>
<th>Cnry</th>
<th>Issue Date</th>
<th>Maturity</th>
<th>Second Opinion</th>
<th>Second Opinion Link</th>
<th>Blog</th>
<th>Reporting</th>
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<td>IDR</td>
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<td>Feb-16</td>
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<td>SPD Bank</td>
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<td>CNY</td>
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<td>EY</td>
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<td>Jan-18</td>
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<td>SEK</td>
<td>Jan-16</td>
<td>Jan-21</td>
<td>CICERO</td>
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<tr>
<td>EIB</td>
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<td>SEK</td>
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<td>Jan-21</td>
<td>CICERO</td>
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<td>&gt;1yr</td>
<td></td>
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<tr>
<td>San Diego Unified School District</td>
<td>100,000,000</td>
<td>USD</td>
<td>Jan-16</td>
<td>None</td>
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<td>&gt;1yr</td>
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<td>ING</td>
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<td>USD</td>
<td>Dec-15</td>
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<td>Oekom</td>
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<td>Jun-18</td>
<td>Sustainalytics</td>
<td>Available</td>
<td>&gt;1yr</td>
<td></td>
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</table>

**Sources:**

1. [https://www.climatebonds.net/cbi/pub/data/bonds?items_per_page=20](https://www.climatebonds.net/cbi/pub/data/bonds?items_per_page=20)
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Historical Blip - A Tail Event

Sources:
1. Tullett Prebon. "Perfect Storm". Timeline Index.
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### Credit Creation Process

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Quality Collateral (HQC)*</td>
<td>Currency</td>
<td>No depreciation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Liquid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low haircuts</td>
</tr>
<tr>
<td>Securities Dealers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Banks, Insurance Companies, Asset Managers and Broker Dealers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deposits &amp; Securities</td>
<td>Securities</td>
<td>Bond &amp; Equity Markets</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Currency (promises to retain value backed by HQC - international money)
- Deposits & securities (promises to pay domestic currency in the future)

Notes:

* High Quality Collateral (HQC) is an asset that is a liability of the US Federal Reserve and Federal Government or a similar AAA private paper.

Sources:

The Fossil Fuel Age

Hyman G. Rickover, the four Star American Admiral and ‘father of the nuclear naval fleet’ gave a speech nearly fifty years ago (1957) titled ‘Energy Resources and Our Future’ in which he stated:

“We live in what historians may some day call the Fossil Fuel Age…fossil fuels, being coal, oil, and natural gas, resemble capital in the bank. A prudent and responsible parent will use his capital sparingly, a selfish and irresponsible parent will squander it in riotous living.”

Sources:
1. Clarmond Market Comments: The Devil’s Excrement

Admiral Hyman G. Rickover