



## KAIROS Backgrounder

# The Economics of Sustainability

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### Introduction

Humans, and indeed all life forms, depend on the Earth's ecosystem to sustain life. Without clean air, water, food, shelter and energy we cannot survive. This simple truth is so self-evident that it sounds trite to repeat it. Yet mainstream economic theory ignores the dependence of the human economy on the broader ecosystem.

To achieve sustainability in its broadest sense we must challenge the dominant model of development based on neoclassical economic doctrines and adopt a new model based on ecological economics.

Most mainstream economists take the natural world for granted. They believe in limitless growth based on the exploitation of natural resources and disposal of wastes into the air, ground and bodies of water. They say that price increases will signal any impending shortages and prompt remedial actions. They trust that technological advances will find substitutes for depleting resources.

Former World Bank chief economist and US Treasury Secretary Lawrence Summers, currently an advisor to President Obama, once bluntly stated: "There are no... limits to carrying capacity of the Earth that are likely to bind at any time in the foreseeable future... The idea that we should put limits on growth because of some natural limit is a profound error."<sup>1</sup>

Neoclassical economists like Summers claim that economic growth will overcome poverty and generate wealth to spend on cleaning up the environment.

But as University of British Columbia ecologist William Rees notes "We have an economic system which ... can only exist by consuming the Earth. The human economy is consuming the ecosphere from within because it doesn't even acknowledge the material reality of its dependence."<sup>2</sup>

As Philippine Congress member and director of Focus on the Global South Walden Bello explains "The central problem ... is a mode of production whose main dynamic is the transformation of living nature into dead commodities creating tremendous waste in the process. The driver of this process is consumption – or more appropriately over-consumption – and the motivation is profit or capital accumulation."<sup>3</sup>

In Part One of this paper we briefly contrast the different paradigms of neoclassical economists and ecological economists. In Part Two we look at three examples of how

ecological economics challenges the prevailing model with respect to property rights, the use of natural resources – as illustrated by differing approaches to the depletion of fossil fuels – and free trade. In Part Three we look at how proponents of “degrowth” are extending the critique pioneered by ecological economists. Finally, in Part Four we discuss the implications of the adoption of a new sustainability paradigm for social policy and for finance.

## **PART ONE: TWO PARADIGMS**

### **Dominant Neoclassical Paradigm**

Neoclassical economists insist on measuring economic activity in monetary terms. This bias leads to assigning value only to what can be bought and sold on a market. The focus on money, and particularly the need to keep up payments on debts, pushes aside two other economies that traditionally nurture life. As Vandana Shiva observes: “Nature’s economy (through which environmental regeneration takes place) and the people’s sustenance economy (within which women produce the sustenance for society through ‘invisible’ unpaid work) are being systematically destroyed to create growth in the global market economy.”<sup>4</sup>

The world of money and finance operates according to a different logic from the world of nature and daily life where women perform most of the useful activities — gardening, cooking, house cleaning, child care etc. - that sustain life. But these activities are not assigned a monetary value.

The money system is based on credit. When interest is charged on loans, the system must keep on expanding if those loans are ever to be repaid. Each new loan becomes a lien or a claim on future production. Thus the money system presumes that growth must go on incessantly. In order to pay interest on past debt there must be continuous expansion of remunerative activity. For instance, indebted peasants in less developed countries are compelled to substitute cash crops for subsistence farming so they can keep up loan payments.

The disconnect between the financial system and the real economy is increasingly unsustainable. A study by François Morin describes how in 2002 “the value of speculative [financial] transactions worldwide reached a new plateau of US\$1,122.7 trillion. The total is 34.76 times the US\$32.3 trillion in goods and services” produced that year.<sup>5</sup>

While the money system requires continual expansion, it ignores the limits nature places on the throughput of resources. Ecological economist Herman Daly compares the exclusive focus on money flows to behaving like a medical doctor who treats only the patient’s blood circulation while ignoring the digestive system, the bone structure, the pulmonary system and other vital organs.

### **Focus on GDP Growth Leads to Unsustainability**

Most economists and policy makers are fixated on measuring economic progress in terms of growth in Gross Domestic Product (GDP). But GDP measures market activity only. A

major deficiency is that GDP measurements take for granted the “free” inputs that humans appropriate from the natural world.

GDP does not account for the depreciation of natural capital the way other accounting conventions depreciate human made capital. If a forest is cut down for wood, GDP increases. But the costs in terms of lost habitat, lost conversion of carbon dioxide into oxygen and the greenhouse effect are not counted.

As Marilyn Waring observes in *Counting for Nothing*:

*When nature reproduces itself... in a way that contributes to the well-being of the community, it is of no value. When nature produces a harvest, which can be processed for the market, it counts for something. When nature has a market value, destruction other than for the market gives rise to legal suit; when nature's function is invisible and valueless, it can be destroyed at will.<sup>6</sup>*

GDP as a measure of economic progress tends to reward the maximum use of throughputs. Take the example of a refrigerator. The more energy the appliance uses, the more GDP grows. The GDP increases in the year a new fridge is purchased and increases again the sooner it is replaced. Therefore measurements using GDP do not promote either energy conservation or the long-term durability of consumer products.

GDP measurements fail to take into account unpaid work which is largely undertaken by women. The GDP treats household labour as having no value since it is not paid for in market terms. GDP counts wages paid to a child care worker but not the work of a parent raising a child. Statistics Canada estimates that unpaid work is worth at least as much as one-third of Canada's official GDP. According to the International Women Count Network, “between 60% and 80% of food production in Africa and Latin America is [from] the unremunerated work of women; most of that production is not officially measured.”<sup>7</sup>

GDP rises with polluting activities and again with attempts to deal with their consequences. More private automobiles, more smog and more respiratory diseases all increase GDP. Marilyn Waring cites the example of the break up of the Exxon Valdez oil tanker which made a “superb contribution to economic growth in 1991.”<sup>8</sup> The cost of cleaning up after the accident, insurance payments to property owners, legal expenses and a replacement tanker load of Alaskan crude all added to GDP.

Finally, GDP ignores income distribution. It implies that more is always better however unevenly the benefits are shared. In the past GDP growth was welcomed on the assumption that “a rising tide raises all boats.” An increasing gap between the rich and the poor seemed acceptable as long as the poor could improve their lot, however marginally.

## **Ecological Economics**

In contrast to the neo-classical view, ecological economists recognize the human economy as a subsystem within the earth's ecosystem. With the exception of solar energy, all economic activity depends on the use and reuse of limited material inputs which ecological economists call "throughput". The throughput of raw materials and the output of wastes cannot expand forever.

Ecological economics does not deny the need to develop cleaner production techniques, but neither does it accept the claim that technological advances alone can be sufficient to resolve the grave environmental challenges we face today.

Ecological economists reject using GDP as a measure of progress. We need new measurements that assign a value to the Earth and its produce as well as to unpaid labour performed mostly by women. There are several alternative indicators under development that give a better and more holistic picture such as the following:

- The Genuine Progress Indicator (GPI), developed by the Redefining Progress Institute in San Francisco;
- The Calvert-Henderson Quality of Life Indicators;
- The new Canadian Index of Wellbeing – still under construction by a group chaired by former Saskatchewan premier Roy Romanow;
- The Gross National Happiness indicator as adopted in Bhutan which includes psychological and spiritual wellbeing.

Each of these indicators has strengths and weaknesses. There is no one simple measure, especially when categories such as spiritual wellbeing involving subjective judgments are included.

From the point of view of ecological economics, indicators should have the following characteristics:

- assign value to the Earth and its produce.
- subtract the costs of actions that destroy ecosystems (For example, the GPI deducts imputed values for air, water and noise pollution and costs incurred by the loss of wetlands, farmland and soil quality.)
- treat some environmental costs as cumulative. (For example, some of the by-products of energy generation, such as emissions of greenhouse gasses and nuclear wastes, are subtracted in the GPI in the year they are generated and are factored into future GPI calculations.)
- assign value to unwaged work done within the household preparing meals, cleaning and caring for children.
- reflect the need to minimize resource throughputs (For example, the GPI subtracts the cost of the throughputs used to manufacture a refrigerator but adds a value each year for the benefits derived from its use. Thus the GPI grows larger the longer the refrigerator lasts and declines if it has to be replaced.)
- account for income distribution. (For example, the GPI grows if income is shared more equally and falls when income is concentrated in fewer hands.)

## Ecological Economics Challenges Neoclassical Assumptions

Neoclassical Assumptions	Ecological Economics
Inputs from natural world are free and abundant	Natural capital is finite; we must learn to live on annual income from natural capital without depleting it unsustainably
Wastes can be easily absorbed	Some wastes already exceed the Earth's absorption capacity e.g. only half of all CO <sub>2</sub> emissions are now absorbed
Human capital can substitute for natural capital	Human capital and natural capital are complementary
Free trade overcomes resource scarcities	Free trade can deplete natural capital from other regions at unsustainable rates
Economic growth is necessary to overcome poverty and generate wealth for environmental clean-up	Economic growth without redistribution exacerbates inequality; growth in throughput may deplete natural capital; qualitative improvements in well-being are possible without growth
Economic growth is necessary for repayment of financial debts	Some debts cannot and should not be paid in light of the larger ecological debts the people of the North owe to the peoples of the South
Price increases will signal scarcities and lead to conservation and substitution	Market prices do not always detect physical limits or measure environmental costs; there are no market indicators for such essential components as the ozone layer
Technological advances will find substitutes for depleting resources	Technology can improve efficiency of resource use but cannot find substitutes for most natural resources
Progress can be measured in monetary terms via growth in Gross Domestic Product	Need holistic indicators like Genuine Progress Indicator or Gross National Happiness

## **PART TWO: HOW ECOLOGICAL ECONOMICS CHALLENGES PREVAILING VIEWS ON PROPERTY RIGHTS, NATURAL RESOURCES AND FREE TRADE**

### **Property Rights**

In the neoclassical approach property rights are absolute and owners are entitled to use or misuse “natural resources” as they wish with the sole aim of maximizing profits. Ecological economists challenge the notion that humans have a right to manipulate Creation to accumulate wealth regardless of the consequences for ecosystems and future generations.

Ulrich Duchrow and Franz Hinkelammert assert that a different approach to property ownership is needed to preserve the natural bounty of Creation. They cite H. C. Binswanger who writes: “environmental goods, as true assets, should only be used and not consumed – at least not wastefully. An environmentally sound property order must therefore have the goal of countering the ‘monetisation’ of wealth and the transformation of all non-monetary goods into consumer goods.”<sup>9</sup>

Duchrow and Hinkelammert then discuss how the ownership system must be modified to accommodate a different attitude to the natural world. They invoke a distinction in Roman law between *patrimonium* and *dominium*. While the latter type of ownership implies that one can do whatever one likes with one’s property, *patrimonium* is based on passing on hereditary goods to one’s children. They cite the example of forestry laws where the state requires owners to use a forest sustainably.

They go on to say that this notion of sustainable use of natural resources should be applied to all soil, water and land management – prohibiting, for example, agricultural practices that mine the soil or deplete underground aquifers. Unlike the traditional notion of property based on *dominium* where property ownership is absolute, the preservation of ecosystems should be integrated into the concept of ownership and “priority in decision-making given to the cooperatives of local and regional residents affected by decisions” on property use.<sup>10</sup>

The concept of property as *patrimonium* corresponds to the beliefs of Indigenous peoples who view land, water, vegetation and animals as life-giving gifts from the Creator that must not be despoiled but nurtured and passed on to future generations.

### **“Natural Resources” versus “Natural Capital”**

Neoclassical economists tend to treat what they call “natural resources” as lacking in intrinsic value until they are taken out of the ground and sold. The price these resources fetch on commodity markets then becomes the measure of their value. According to this logic it makes sense to maximize the extraction and use of minerals, fossil fuels or forests. They also treat the supply of natural resources as expandable. As E. Zimmerman put it back in 1951 “Resources are *not*, they *become*.”<sup>11</sup> Mark Jaccard explains what Zimmerman meant with the following example: “When we only had technologies to extract oil from land-based oil wells, then oil under the seas was not a resource. When we

developed the offshore technologies, then undersea oil became a resource. In more recent decades, oil sands were not oil resources. Today they most decidedly are.”<sup>12</sup>

Ecological economists have a different view. They value the intrinsic worth of what they call “natural capital”, a category that includes both life-sustaining renewable items like forests and fish stocks, and non-renewable assets like fossil fuels. Ecological economics requires us to learn how to live on the annual flows or “income” from existing stocks of natural capital, without depleting them unsustainably.

Whereas neoclassical economists assume that human made capital can substitute for natural capital, ecological economists show how this is seldom the case. For most purposes human and natural capital are complementary inputs. One cannot build the same wooden house with only half the timber no matter how many saws and carpenters one wishes to substitute. One may choose to use bricks instead, but one still uses natural capital to make the bricks. Natural capital is subject to depletion by inappropriate uses of human capital as occurred when cod stocks were over fished by factory trawlers.

### **Fossil Fuels are Depleting**

Neoclassical economists maintain that resource depletion is not a fundamental problem as rising prices for scarce resources will lead to conservation and the search for substitutes. In fact market prices do not necessarily detect the physical limits of resources, as shown by their failure to signal how soon world oil production will reach its peak. Peak oil refers to the point in time when the maximum rate of global petroleum extraction is reached, after which the rate of production will decline.

Peak oil does not mean that the world is running out of petroleum. Rather it is the point where “oil production cannot grow to meet rising demand.”<sup>13</sup> Some geologists say that world oil production may already have peaked, while the average prediction among 23 leading authorities is that it will occur by 2014. Production from many of the world’s major oil producing countries is dropping by 3% to 4% per year or more. “We now consume between six and ten barrels of oil for each one we discover.”<sup>14</sup> One reason why oil prices have not risen higher is that demand has been depressed by the current economic crisis. But prices are sure to rise as global demand for oil is expected to increase by 24% by 2030 according to the International Energy Agency.<sup>15</sup>

Neoclassical economists say higher prices will stimulate conservation, induce drilling in deeper waters, encourage high-tech enhanced oil recovery from existing mature oil fields through the injection of carbon dioxide captured from industrial plants and prompt further development of unconventional sources such as the tar sands.

Ecological economists view the phenomenon of peak oil from a wider perspective that takes into account the external costs of resource exploitation, such as the health costs resulting from pollution and the loss of wildlife habitat. While the market price for gasoline may tell us something about how much it costs to extract, ship, refine and market non-renewable hydrocarbons, it does not reflect the environmental damage of

exploiting petroleum from a fragile Arctic ecosystem or greenhouse gas (GHG) emissions into the atmosphere from burning fossil fuels.

Market solutions to peak oil, such as turning bitumen into synthetic oil, will only make GHG emissions worse since extracting crude from the tar sands releases three times as much CO<sub>2</sub> as is released from conventional oil wells. While the higher prices that will result from peak oil may lead to greater conservation measures, markets left to their own dynamics will not necessarily lead to replacing fossil fuels with renewable substitutes.

Another reason why market prices give inadequate signals concerning ecological devastation is that humans depend on numerous biophysical and geophysical goods for which there are no markets or feasible substitutes. Consider, for example, the ozone layer which protects us from harmful ultraviolet radiation. There is no simple market mechanism that will lead to the reduction of damaging chlorofluorocarbon (CFC) emissions as effectively as an outright ban on their production.

### **Diminishing Energy Return on Investment**

One illustration of the unsustainability of the current economic model is the trend towards a diminishing Energy Return on Energy Investment (EROEI). EROEI measures the amount of energy that must be expended in order to obtain another form of useful energy – for example, the energy contained in the natural gas used to extract synthetic oil from the tar sands. As geologist J. David Hughes puts it “It costs energy to get energy, and the whole point is to get back more than you put in.”<sup>16</sup> Hughes describes how the giant Ghawar oil field in Saudi Arabia has a net energy payback of greater than 100 to 1, that is over 100 units of energy are produced for each one expended to extract oil from that field.

As petroleum becomes scarcer and oil wells must be drilled in ever deeper waters offshore or into smaller deposits the EROI tends to fall. Tar sands mining has an EROI of only 6 to 1. Steam Assisted Gravity Drainage projects that use natural gas to produce steam to separate the bitumen from the sand have an EROI of about 3 to 1. For corn-based ethanol the numbers are even worse with just 1.3 units of useful energy for each unit expended according to some estimates and a negative return of only 0.79 units from each unit invested according to other calculations based on a fuller accounting of all energy inputs used. (see [KAIROS Briefing Paper “Are Agrofuels Alternatives to Oil?”](#))

Hughes argues that while higher prices and technological developments can lower the EROEI for fossil fuels for a time, eventually one reaches a point where the net energy return is zero. “The sobering news is that much of the hydrocarbons now in the ground ... will never get burned.”<sup>17</sup> He goes on the point out that the same concept applies to renewable energy sources. For example, a wind turbine’s output must be balanced against all the energy used to mine coal and iron ore, transport them, smelt the ore into steel and manufacture the turbine. Hughes concludes that “At a good wind site, the energy payback day could be in three years or less; in a poor location, energy payback may be never.”<sup>18</sup>



Hughes goes on to lament that the concept of EROEI is lost on many economists. In the same volume economist Mark Jaccard makes the counter-argument that a combination of technological improvements and cost factors will allow the extraction of energy from fossil fuels to continue. For example, Jaccard suggests that tar sands operators might burn more of the heavy fuel they extract from bitumen instead of using natural gas to produce the heat and the hydrogen they need to make more synthetic oil. In making his argument Jaccard makes two crucial assumptions:

**“If oil sands exist free in nature and if humanity can develop ways to extract this resource at reasonable capital cost **without depleting natural water flows or negatively altering the value of the land** (either by rehabilitating open-pit mines or by using less harmful in situ extraction of oil from the oil sands), then it does not really matter if the energy return on investment is lower than for conventional oil. **All that matters is cost.**”<sup>19</sup> (emphasis added)**

It is precisely these assumptions that lead ecological economists to reject the perspective of mainstream economists. Ecological economists do not accept that natural capital is “free in nature” nor is there any evidence that boreal forests or waters from the Athabaska river can be returned to a pristine state.

The study of diminishing Energy Return on Investment deserves much more attention than it has hitherto received in mainstream economics. A new study by Richard Heinberg looks at ten different factors affecting the availability of eighteen different energy sources both non-renewable fossil fuels and renewable substitutes. After reviewing nine criteria – direct monetary cost, dependence on additional resources, environmental impacts, renewability, potential size or scale of contribution, location of the resource, reliability, energy density, and transportability – Heinberg focus on the tenth crucial factor “net energy” or Energy Return on Energy Investment as the most important determining factor.

Table 1 illustrates a range of estimates for energy return on energy invested as cited in Heinberg’s study. What is most notable about the table is how the EROEI for many kinds of renewable energy compares with the EROEI for conventional oil and natural gas. In the case of the upper range for hydro power, the EROEI is clearly superior. In the case of wind and wave energy and some kinds of solar photovoltaic and geothermal energy, it is comparable to natural gas. Hence investments should be directed towards these options instead of the clearly inferior return from investments in tar sands, oil shale or ethanol.

**Table 1: Energy Return on Energy Invested and Costs**

	<b>EROEI</b>	<b>Cents / kWh</b>
Hydro	11:1 to 267:1	1
Coal	50:1	2 to 4
Oil (global average)	19:1	
Natural gas	10:1	4 to 7
Wind	18:1	4.5 to 10
Wave	15:1	12
Solar Photovoltaic	3.75:1 to 10:1	21 to 83
Geothermal	2:1 to 13:1	10
Tidal	~ 6:1	10
Tar sands	5.2:1 to 5.8:1	
Oil shale	1.5:1 to 4:1	
Nuclear	1.1:1 to 15:1	2 to 9
Biodiesel	1.9:1 to 9:1	
Solar thermal	1.6:1	6 to 15
Ethanol	0.5:1 to 8:1	

Source: Heinberg, Richard. *Searching for a Miracle*. Tables 1A, 2 and 3.

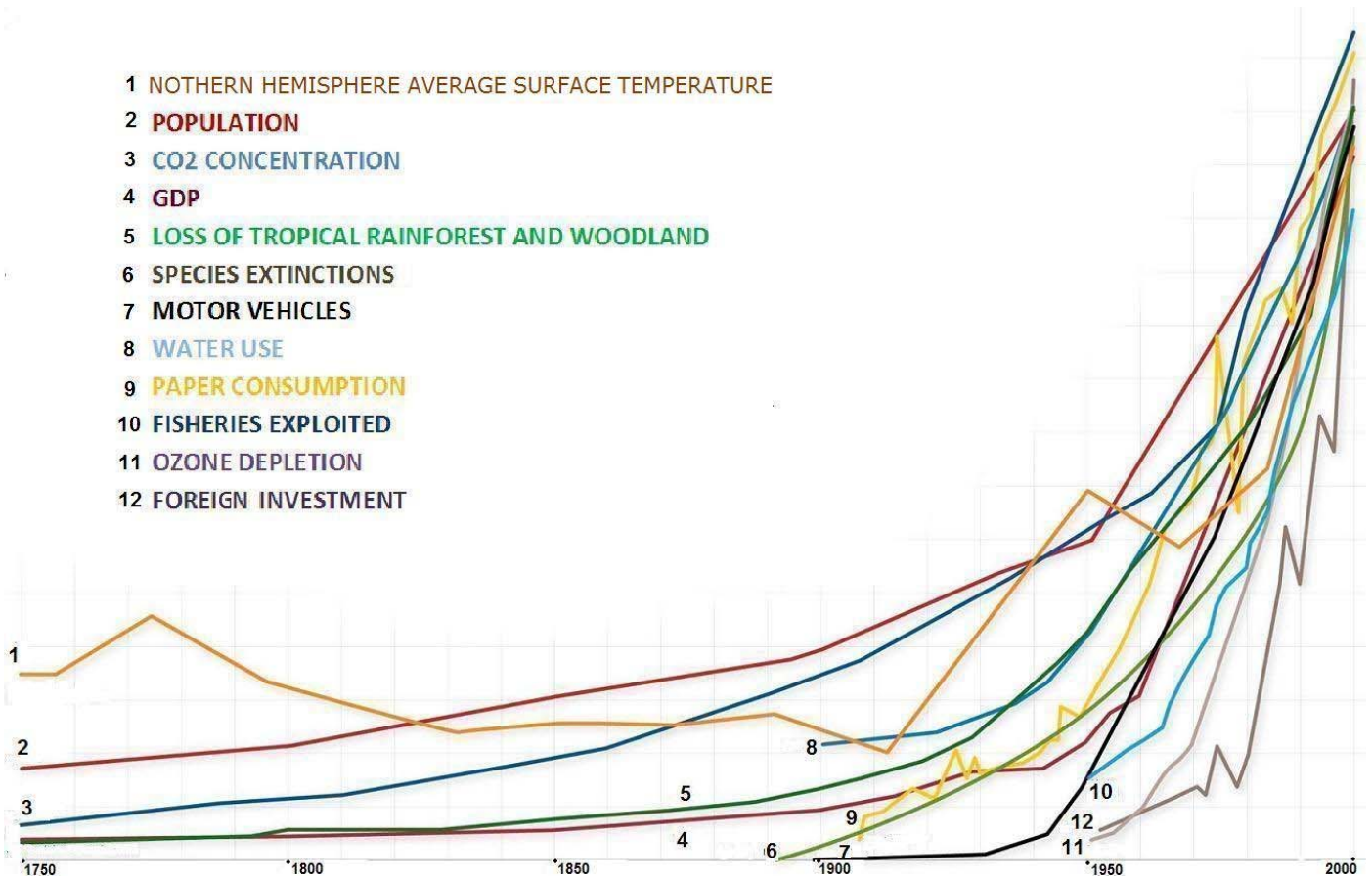
Of course EROEI is only one of the ten criteria studied by Heinberg who also shows that renewable energy sources faces other challenges starting with their cost. As illustrated by the right-hand column in Table 1, with the exception of hydro, electricity generation from renewable sources is more expensive than from coal or natural gas. In addition there are important challenges to the deployment of renewable energy systems due to their variable environmental impacts, potential scales of contribution, locations, reliabilities, energy densities, and transportabilities. When all of these factors are taken into account Heinberg's overall conclusion presents a significant challenge:

“The fundamental disturbing conclusion of the report is that there is little likelihood that either conventional fossil fuels or alternative energy sources can reliably be counted on to provide the amount and quality of energy that will be needed to sustain economic growth – or even current levels of economic activity – during the remainder of the current century. This ... conclusion in turn suggests that a sensible transition energy plan will have to emphasize energy conservation above all. It also raises questions about the sustainability of growth *per se*, both in terms of human population numbers and economic activity.”<sup>20</sup>

### **Exponential Growth is Not Sustainable**

The following chart illustrates how indicators of ecosystem distress such as global warming due to increased CO<sub>2</sub> concentrations, loss of tropical forests and the depletion of fisheries correlate with economic indicators such as increasing GDP and use of motor vehicles and paper products.<sup>21</sup> The continued exponential growth of all these indicators is clearly not sustainable.

# Trend Towards Exponential Growth is Not Sustainable



### **Free Trade Incompatible with Sustainability**

Neoclassical economists overwhelmingly promote free trade as a solution to resource scarcity. If a society has cut down all its forests then it can import wood or paper from abroad. Ecological economics questions the wisdom of free trade, in part because there are real limits to the amount of trade that can take place without drawing down the natural capital of other regions at unsustainable rates.

Since Northern industrial countries already appropriate a disproportionate share of the world's natural capital, free trade effectively deprives less developed countries of their fair share. Perhaps the most extreme example of how neo-classical economic thinking disregards the well being of the peoples of the South is the infamous memo signed by Lawrence Summers in 1991 when he was chief economist at the World Bank. That memo argues that "the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable ... [since] under-populated countries in Africa are vastly under-polluted."<sup>22</sup>

When goods are exported at prices that do not take into account the social and ecological costs of their extraction or production the result is ecologically unequal terms of trade. Joan Martinez Alier cites as an example Mexican oil sold to the US at a price that does not take into account "the massive environmental damages caused by oil drilling in the rainforests of Tabasco and Campeche."<sup>23</sup>

Furthermore, neoclassical economists are not concerned about the environmental impact of the long distance shipping of products that could be produced close to where they are consumed. Foods that are shipped over long distances are typically treated with chemicals to preserve their appearance if not their nutritional value.

Moreover, free trade agreements undercut the ability of states to preserve natural capital. For example, the proportional sharing clause in the North American Free Trade Agreement limits Canada's ability to control exports of non-renewable natural resources in the interests of conservation. Unless Canada renegotiates or abrogates NAFTA, it cannot restrict exports to conserve our nonrenewable petroleum reserves. Under NAFTA Article 605 Canada is obliged to make available to US buyers the same proportion of total oil and gas supplies as was exported over the previous three years even if this leads to domestic shortages.

In *Over a Barrel* Gordon Laxer and John Dillon explain that if the proportional sharing clause had been invoked in 2007 Canada would have had to make 47.5% of its oil supplies available to the US.<sup>24</sup> More recent data from Statistics Canada reveals that by 2008 the proportional sharing requirement had grown to 48.6% of total supply and in 2009 it stood at 50.5%.<sup>25</sup> *Over a Barrel* uses the hypothetical example of an attempt to reduce Canadian oil production by one tenth as a conservation measure. Were this step taken in 2007 the proportional sharing clause would have come into effect leading to a modest shortfall in supply needed to meet Canadian needs equivalent to one and a half days of domestic demand. If such a measure were attempted in 2008 the domestic

shortfall would have amounted to 18 days of Canadian demand. By 2009 the potential shortfall had risen to 32 days.

Other NAFTA provisions prohibit the use of export taxes, export quotas or minimum prices that could be used to conserve non-renewable hydrocarbons. Moreover, NAFTA's investor-state provisions allow foreign corporations to sue Canadian companies for environmental measures such as the cancellation of a water withdrawal licence for a tar sands operation due to the impact on fisheries.

In their textbook on *Ecological Economics*, Herman Daly and Joshua Farley show how the assumptions that lie behind David Ricardo's classical theory of comparative advantage as the rationale for free trade do not hold up particularly in a world of rising transportation costs and capital mobility.<sup>26</sup> For ecological reasons we must reduce rather than increase international trade. As Daly puts it, we must "move toward a more nationalist orientation that seeks to develop domestic production for internal markets as the first option, having recourse to international trade only when clearly much more efficient."<sup>27</sup>

In a sustainable economy trade and investment should be highly regulated and favour domestic production of those goods and services necessary to provide for the population's basic needs. This kind of process will not be led by market forces.

In order to achieve sustainability, there must be a progressive reduction of exports of goods that are intensive in natural resources and energy. Trade in those goods should be subject to additional taxes, for example a carbon tax on fossil fuels.

### **PART THREE: SUSTAINABLE DEGROWTH**

The goal of living within our ecological means is often described as “sustainable development”. The term was first used by the 1987 Brundtland Commission report *Our Common Future* which talked about development which meets the needs of the present without compromising the ability of future generations to meet their needs. However, the phrase has become one of the most elastic of concepts. It is used in many varied and sometimes contradictory ways.

Brundtland’s elastic concept allowed for continued economic growth in both industrial and developing countries. In fact the Brundtland report anticipates a five- to ten-fold increase in world industrial output by the time world population might stabilize at some point in the twenty-first century.<sup>28</sup> Accordingly, some business groups have declared themselves in favour of “sustainable development”.

Since the release of the Brundtland report many have questioned whether growth on this scale is desirable or even possible. Ecological economists seek a more refined understanding. Herman Daly and Joshua Farley distinguish between *growth* which is dependent on a quantitative increase in throughput of natural capital and *development* which involves qualitative improvement in human well-being.<sup>29</sup> Whereas growth cannot continue indefinitely on a finite planet, development can continue through an increase in the quality of goods and services provided by a given throughput.

Daly and Farley define “sustainable development” as “development without growth ... without a quantitative increase in throughput beyond environmental carrying capacity. Carrying capacity is the population of humans that can be sustained by a given ecosystem at a given level of consumption, with given technology.”<sup>30</sup>

Elsewhere Daly advocates a “steady-state economy” involving qualitative improvements through measures that redistribute wealth and increase the productivity of resources without using more natural capital than what can be borne by the regenerative and waste absorption capacities of the ecosphere.

In recent years analysts have begun to advocate what French writers call “*décroissance*”, or “degrowth” involving an actual decline in material throughputs within an economy that is socially sustainable.

If such a steady-state economy is our goal then we must face a fundamental question: How close are we now to the limits of sustainability? If we have already passed those limits then “de-growth” in throughputs used to produce goods and services for the most affluent is a necessity in order to achieve sustainability of the entire human economy. According to the ecological footprint indicator humans already use 125% of the Earth’s regenerative capacity.<sup>31</sup>

Daly asserts that the world is moving rapidly from an era in which shortages of human-made capital were the limiting factor on development to one in which remaining natural

capital limits what can be produced. For instance, fish production is limited by the number of fish in the seas, not by the number of fishing boats.

The UN Food and Agricultural Organization reports that if fishing continues to intensify at its current rate, all ocean fisheries will be exhausted by 2048. The Millennium Report on Ecosystems shows that 60% of world ecosystems are degraded or used in an unsustainable manner.<sup>32</sup>

While various resources that sustain human populations may be in decline, sustainability is ultimately determined not by general conditions but by the single vital factor in least supply. In other words we may surpass the limits of sustainability not because natural resources generally are in short supply, but because we have overused or abused one crucial determinant. Many ecologists believe that the most pressing limiting factor may well be the declining capacity of the ecosphere to absorb carbon dioxide produced by burning fossil fuels.

### **Southern Countries Do Need Some Kinds of Growth**

Scholars exploring the concept of degrowth generally agree that it applies principally to overconsuming middle- and upper-classes in the Global North, while Southern countries still need a form of economic growth to meet their peoples' basic needs. Less developed countries where people consume less than their fair share of the Earth's bounty may expand their resource throughput without violating the principles of sustainable degrowth.

However, this does not mean that Southern countries should imitate the same pattern of development that has been practiced in the North. In Chapter 6 of [Alternatives for the Americas](#) the civil society groups participating in the Hemispheric Social Alliance assert the following vision of sustainability:

Sustainability focuses on the reduction of natural resource and energy consumption by high-income groups. In order to confront social, economic and environmental challenges – as well as the preservation of cultures – it is necessary to first define what should be produced, for whom and with what objectives.

Productive, commercial and financial systems must be subordinated to the preservation of the material base that sustains society, including natural resources and energy.

The concept of sustainability is not static, as it is built within the context of social relations and their interaction with nature. It is not simply a matter of sustainability of resources and the environment, but above all of social forms of utilization of resources and the environment. The appropriation of nature, as it occurs today, is the cause of the current situation in which social inequalities and environmental degradation are simultaneously deepened.<sup>33</sup>

## **PART FOUR: WHAT DEGROWTH MEANS FOR SOCIAL POLICY AND FINANCE**

### **Social Dimensions of Degrowth**

In both the South and the North social policy has an important role to play in achieving equity in societies where the well being of all will take precedence over the acquisition of wealth by a few. As Sallie McFague writes “sharing of material goods [distributive justice] is the principal means to sustainability... There must be limits to inequality in terms of minimum and maximum incomes and also in terms of how much of nature’s wealth we use now versus hold for future generations.”<sup>34</sup>

Introducing the concept of maximum incomes leads to the question “What is the proper range of inequality—one that rewards real differences and contributions rather than just multiplying privilege?” In discussing this question Daly observes how “Plato thought it was a factor of four. Universities, civil services and the military seem to manage with a factor of ten to twenty. In the US corporate sector it is over 500. As a first step could we not try to lower the overall range to a factor of, say, one hundred? Remember, we are no longer trying to provide massive incentives to stimulate (uneconomic) growth! Also, since we are not trying to stimulate aggregate growth, we no longer need to spend billions on advertising. Instead of treating advertising as a tax-deductible cost of production we should tax it heavily as a public nuisance.”<sup>35</sup>

Explicit in the discussion of degrowth is a critique of consumerism and an ethic of “living simply so that others may live.” Marcos Arruda advocates replacing “the economy of waste and discard” with the four **R**’s – **R**educe consumption, **R**euse, **R**ecycle and **R**espect both future generations and ecosystems.<sup>36</sup> Frugality, moderation, avoidance of conspicuous consumption and efforts to use locally-produced goods and services are key elements of ethical consumption.

Arruda cites Mahatma Gandhi observation that “There is enough in the world for everyone’s need, but not for some people’s greed.” He then adds “The concept of abundance is basic to Solidarity economy.... Scarcity is a social and political construct, not a natural condition. ... The ideology of scarcity is congenital to capitalism ... [leading to] consumerism and depredation of natural heritage [as the] inevitable consequences.”<sup>37</sup>

Sustainable degrowth will involve some decoupling of remuneration from market-based wages or salaries. Unpaid domestic work constitutes approximately 50% of all productive activity in industrial countries and up to 60% to 70% in many developing countries. The 1995 Human Development Report estimated unpaid work to be worth US\$16 trillion (US\$11 trillion by women and US\$5 trillion by men) which was not counted in the official data for a world GDP of US\$24 trillion.<sup>38</sup>

In a sustainable economy women doing housework and child care would be remunerated for their labour as would other activities that do not increase material throughput, for example, the work of artists and musicians.



Herman Daly argues that it would be easier to achieve the goal of full employment since “limiting matter-energy throughput would raise the price of energy and resources relative to the price of labour. This would lead to the substitution of labour for energy in production processes and consumption patterns, thus reversing the historical trend of replacing labour with machines and inanimate energy.”<sup>39</sup>

In a sustainable economy there would both be more work of some kinds spread among more workers and more leisure time for cultural and spiritual pursuits through a shorter work week and work year for all. When ecological limits are respected the production and consumption of some goods will require more labour and more time. For example, organic agriculture where weeding is done by hand requires more labour than spraying herbicides. Sustainable forestry practices require more time and labour than clearcutting. Travelling by train takes more time than flying in an airplane. If we ban disposable packaging and disposable dishes, we may lose some jobs in the packaging and plastics industries but create many more jobs in service industries.<sup>40</sup>

### **How can we pay for social programs without growth?**

In response to the 2008-09 financial crisis industrial countries have allocated US\$9 trillion to support their financial institutions through loans, asset purchases and guarantees. For the industrial countries the average amount of support in the form of capital injections, asset purchases, loans and liquidity supplied by central banks has been equal to 48.5% of their GDP.<sup>41</sup> In some countries with large financial industries, like the UK and the USA, the supports available have amounted to over 80% of GDP. The US alone has spent US\$4.4 trillion to bail out private companies. Of this amount, at least US\$1.2 trillion was created out of nothing by the Federal Reserve Board between May of 2007 and January 2009.<sup>42</sup>

Hence as a result of the current financial crisis the ability of central banks to create vast amounts of money, literally out of nothing by in effect printing money, has been exposed for public scrutiny. In fact central banks, like the Bank of Canada, have long been able to spend money into existence without necessarily stoking inflation. Currently, only about three per cent of the money in circulation is actually created by central banks. The rest is created when private financial institutions issue loans.<sup>43</sup>

If we were to rely more on central banks for money creation then we would also have to limit the ability of the private banking system to create money by lending it into existence. This would shrink the overall size of the private financial system, making it easier to curb unnecessary spending that would increase material throughputs. Returning responsibility for managing finance to public authorities through central banks need not be inflationary provided that the amount of new money created is not excessive and is spent on essential goods and services.<sup>44</sup>

While a thorough monetary reform is unlikely to be achieved in the short term, incremental steps can be taken in that direction now. For example, the Alternative Federal Budget has proposed refinancing 2% of the federal government’s debt each year

through the Bank of Canada. To avoid inflation as a result of excessive money supply tighter controls would have to be put on private banks' money creation through higher reserve requirements.

Herman Daly argues that the steady-state economy would “benefit from a move away from our fractional reserve banking system toward 100% reserve requirements. One hundred percent reserves would put our money supply back under the control of the government rather than the private banking sector. Money would be a true public utility, rather than the by-product of commercial lending and borrowing in pursuit of growth. Under the existing fractional reserve system the money supply expands during a boom, and contracts during a slump, reinforcing the cyclical tendency of the economy. The profit (seigniorage) from creating (at negligible cost) and being the first to spend new money and receive its full exchange value, would accrue to the public rather than the private sector. The reserve requirement, something the Central Bank manipulates anyway, could be raised from current very low levels **gradually** to 100%. Commercial banks would make their income by financial intermediation (lending savers' money for them) as well as by service charges on checking accounts, rather than by lending at interest money they create out of nothing. Lending only money that has actually been saved by someone ... would prevent such debacles as the ‘sub-prime mortgage’ crisis. 100% reserves would both stabilize the economy and slow down the Ponzi-like credit leveraging.”<sup>45</sup>

### **Who will pay the debts? Nobody.**

As Mark Hathaway explains in *Jubilee Wealth and the Market* it is impossible for real wealth derived from nature to grow at the pace at which compound interest grows on loans. “The very nature of compound interest means that debt spirals out of control exponentially. In this way debt is fundamentally different from real wealth. At the very best wealth can grow at the rate of natural regeneration (like a forest), something that is limited by the fixed rate at which sunlight is absorbed and by other ecological boundaries. From an ecological point of view it is inconceivable that that wealth can grow exponentially over any extended period of time.”<sup>46</sup>

In light of this reality Herman Daly suggests “there would likely be a healthy shrinkage of the enormous pyramid of debt that is precariously balanced atop the real economy, threatening to crash.”<sup>47</sup> Similarly, Joan Martinez-Allier provides a simple answer to his rhetorical question: “Who will pay the mountain of outstanding credits, mortgages, and public debts if the economy does not grow? The answer must be nobody. We cannot force the economy to grow indefinitely at the pace at which compound interest grows on loans. The financial system must have new rules, different from the present ones.”<sup>48</sup> We cannot forever go on creating fictitious growth to satisfy creditors, or speculators in derivatives and other monetary instruments.

Just as the mountain of unsustainable past debts must be written-off as they cannot be repaid, so too must we change the International Financial System which is clearly not sustainable. As the *Financial Times* economics editor Martin Wolf has stated the resolution of the current financial crisis must involve a new global financial system: “The

world economy cannot go back to where it was before the crisis, because that was demonstrably unsustainable.”<sup>49</sup>

A further obstacle to sustainable finance is the tendency of capital to flee any country that attempts to regulate or tax financial transactions. In Daly’s words “International capital mobility, coupled with free trade, allows corporations to escape from national regulation in the public interest, playing one nation off against another.”<sup>50</sup>

One consequence of the global financial crisis is that a number of possible remedies to capital flight are now under debate. These range from a Financial Transaction Tax on all trades of financial products (including equities, bonds, derivatives, and not just foreign exchange as originally proposed by James Tobin) to several types of capital controls such as the *encaje* pioneered by Chile that required foreign investors to keep their money in the country for a specified period of time. Ultimately what is needed is a new global reserve system, modelled on the original proposal of John Maynard Keynes for an International Clearing Union, advocated by the Commission of Experts on Reforms to the International Monetary and Financial System chaired by Joseph Stiglitz.

A discussion of what a new international financial system would look like is beyond the scope of this paper. However, a description of some proposals currently under discussion is contained in two recent KAIROS publications: [Policy Briefing Paper Number 19](#) “Financial Crisis An Opportunity for a New Global Order” and [Policy Briefing Paper Number 24](#) “An Idea Whose Time Has Come: Adopt a Financial Transactions Tax.”

### **Conclusion**

This paper has provided a short overview of the main differences between the dominant economic paradigm that has brought the world to the brink of ecological disaster and a new, sustainable and just economic model. While the challenges of making the transition are monumental, the proposals of ecological economists provide viable alternatives.

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*KAIROS: Canadian Ecumenical Justice Initiatives unites eleven churches and religious institutions in work for social justice in Canada and around the globe.*

## Endnotes

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