

# The World on a Collision Course and the Need for a New Economy

## Contribution to the 2009 Royal Colloquium

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**Abstract** The first part of the paper is an attempt to demonstrate that what we are going through at the present time is not just an economic-financial crisis, but a crisis of humanity. It seems that for the first time in human history several crises converge to simultaneously reach their maximum level of tension. The dominant economic model is to a great degree responsible for the world's collision course. Hence a number of myths that sustain the model are listed and analyzed. It is argued that a new economy, coherent with the *problematics* of the twenty first century, needs urgently to be devised. The second part proposes the foundations for a new economy based on five fundamental postulates that allow the construction of transdisciplinary, holistic, and systemic visions to adequately understand the interdependence of all the elements that sustain life. It is stressed that it is no longer acceptable that Universities still teach economic theories of the nineteenth century in order to tackle twenty first century problems that have no precedence.

**Keywords** New economy · Human needs · Ecosystem services · GPI · Speculation

### PREAMBLE

In October 2008, at the same time that the Food and Agriculture Organization of the United Nations (FAO) was informing that hunger is affecting 1.000 million people, and estimated that 30.000 million dollars annually would suffice to save those lives, the concerted action of six central banks (USA, UE, Japan, Canada, United Kingdom, and Switzerland) poured 180.000 million dollars into the financial markets in order to save private banks. The US Senate approved an addition of 700.000 million dollars. Two weeks later, another 850.000 million were approved

in the United States. That not being enough, the rescue package has continued to grow until today (September 2009), reaching an estimate of 17 trillion dollars.<sup>1</sup>

Facing such a situation, we are confronted with two alternatives: to be a demagogue or to be a realist. If based on the law of supply and demand, I say that there is a greater demand in the world for bread than for luxury cruises; and much more for the treatment of malaria than for apparel of *haute couture*; or if I propose a referendum asking the citizens if they prefer to use their monetary reserves to save lives or to save banks; I will be accused of being a demagogue. If, on the contrary, I accept that it is more urgent, more necessary, and more convenient and profitable to all, to avoid an insurance company or a bank to go bankrupt, instead of feeding millions of children, or giving aid to victims of a hurricane, or curing the dengue, it will be said that I am a realist.

That is the world in which we are. A world accustomed to the fact that *there is never enough for those who have nothing, but there is always enough for those who have everything*. The obvious question arises: Where was that money? For decades we have been told that there are not enough resources to overcome poverty, yet there are more than enough resources to satisfy the wants of speculators. Seventeen trillion dollars divided by the 30 billion the FAO estimates as enough for overcoming world hunger, instead of saving private banks, could generate *566 years of a world without hunger*. Would not a world without misery be a better world for everyone, even for the banks?

What are we facing in our world today?

<sup>1</sup> In this article, we refer to billion as one thousand million, and trillion as one million millions.

## THE QUADRUPLE CONVERGENCE<sup>2</sup>

- (1) Exponential increase of human-induced climate change affecting all regions of the world.
- (2) The end of cheap energy, with dramatic effects on societies.
- (3) Extensive depletion of key resources basic to human welfare and production; like fresh water, genetic resources, forests, fisheries, wildlife, soils, coral reefs, and most elements of local, regional, and global commons.
- (4) The gigantic speculation bubble that is 50 times larger than the real economy of exchange of goods and services.

The root causes are:

- (1) The dominant economic paradigm, which poses rapid economic growth at any cost, and stimulates corporate greed and accumulation.
- (2) The uncontrolled use of fossil fuels to feed that obsessive economic growth.
- (3) The promotion of consumerism as the road to human happiness.
- (4) The decimation of traditional cultures, in order to impose conventional economic industrial models; which determines the loss of cosmologies, languages, and values that differ from those of the dominant culture.
- (5) Disregard of planetary limits, in relation to resource availability, consumption, waste generation, and absorption.
- (6) Overpopulation. Eventual growth beyond the capacity of the Earth to sustain.

### Consequences

The mentioned conditions may bring about unprecedented dangerous environmental and social costs.

- (1) Climate chaos and global warming imply loss of much productive land, storms, rising sea waters, massive dislocation, desertification, and economic and social problems especially in poorer countries.
- (2) Depletion of inexpensive oil and gas supplies has a direct impact on the world over, threatening industrial future development. Will make increasingly difficult industrial food systems, urban and sub-urban systems

as well as many commodities basic to our accustomed way of life, like: autos, plastics, chemicals, refrigeration, etc. All rooted in the assumption of ever increasing inexpensive energy supply.

- (3) Other resource shortages like fresh water, forests, agricultural land, biodiversity; facing the possible loss of 50% of the world's plant and animal species over the next decades.

### CRISIS OR CRISES

It should be stressed that what we are facing today is not simply an economic and financial crisis, but a crisis of humanity. Probably never before in human history have so many crises converged simultaneously to reach their maximum level of tension. Rather what used to happen was one crisis followed by another. Now we have them all together, which represents a monumental challenge.

Apart from the aspects already mentioned, we can add increasing political, economic, religious, and sports corruption; the consolidation of greed as a fundamental value; gigantic enterprises exclusively concerned with their own benefits; judicial systems that forget justice; obsession with growth at any cost; destruction of Nature, disdain for the planetary limits; decadence of the school and the health systems; hyper-consumerism; hyper-individualism; global warming; climate change; eagerness for power and disdain for life. Colossal convergences that can only derive in equally colossal outcomes.

### Solutions

Solutions imply new models that, above all else, begin to accept the limits of the carrying capacity of the Earth. Move from *efficiency* to *sufficiency and well-being*. Also necessary is the solution of the present economic imbalances and inequities. Without equity peaceful solutions are not possible. We need to replace the dominant values of greed, competition, and accumulation, for those of solidarity, cooperation, and compassion.

The paradigm shift requires turning away from economic growth at any cost. Transition must be towards societies that can adjust to reduced level of production and consumption, favoring localized systems of economic organization. We need again to look to the inside.

We need, however, to understand why the dominant economic model has become so strongly ingrained in our world and in our everyday life. We shall see that its strength rests on mythology.

<sup>2</sup> Ideas for this section have been taken from "Manifesto on Global Transitions". The International Forum on Globalization. Edited by Jerry Mander, September 2007.

## THE MYTHS THAT SUSTAIN THE DOMINANT MODEL<sup>3</sup>

### Myth 1. Globalization is the Only Effective Route to Development

Between 1960 and 1980 the majority of developing countries, especially in Latin America, adopted the principle of “import substitution,” which allowed a significant industrial development. During that period per capita income in Latin America grew 73% and in Africa 34%. After 1980 economic growth in Latin America came to a virtual halt, increasing, as an average, not more than 6% over 20 years, while growth in Africa declined by 23%.

The period 1980–2000 annihilates import substitution, and replaces it by deregulation, privatizations, elimination of international trade barriers, and full openness to foreign investments. The transition was from an inward-looking economy to an outward-looking one. The results indicate that the poorest countries went from a per capita growth rate of 1.9% annually in the 1960–1980 period, to a decline of 0.5% a year between 1980 and 2000. The middle group of countries did worse, dropping from annual growth of 3.6% to just under 1% after 1980. The world richest countries also showed a slowdown.

Countries like South Korea and Taiwan, frequently given as examples to be emulated, achieved their development through trade barriers, state ownership of the big banks, export subsidies, violation of patents and intellectual property, and restrictions to capital flows including direct foreign investment. It would be absolutely impossible for any country to replicate these strategies today, without severely violating the regulations of the World Trade Organization (WTO) and the International Monetary Fund (IMF).

### Myth 2. Greater Integration into the World Economy is Good for the Poor

Poor countries must adapt to a number of rules and restrictions established by the international organizations. The result is that poor countries divert human resources, administrative capacities, and political capital away from more urgent development priorities such as education, public health, and industrial capacity.

In 1965, the average per capita income of the G7 countries was 20 times that of the seven poorest countries. In 1995 it was 39 times larger, and today it is over 50

times. In practically all developing countries that have adapted to a rapid trade liberalization, the income inequality has increased, and real incomes have declined between 20 and 30% in Latin America.

More than 80 countries have today a lower real per capita income than one or two decades ago. The paradox is that precisely the more marginal countries are the ones that have integrated themselves more completely into the global economy.

### Myth 3. Comparative Advantage is the Most Efficient Way to Ensure a Prosperous World

One of the unquestioned principles of modern politics is the need for global free trade. To doubt of its benefits is an act of heresy. However, in spite of its supposed greater efficiency, compared with other systems of economic organization, global free trade is notoriously inefficient in real terms. By giving greater priority to large scale production for export purposes, instead of small and medium scale production for local needs; and by generating competitive pressures that confront communities with communities the world over, the prices of consumer products may decrease, but at an enormous social and environmental expense.

There is still a dominant belief about the benefits of adhering to comparative advantages. However, according to the model of David Ricardo (creator of the concept) the system functions as long as there is no transnational mobility of capital. Internally, capital searches for the most adequate niche that gives it the comparative advantage. However, when capital is granted full transnational mobility, it will look for absolute advantages in countries that allow for lower salaries, lower taxes and less environmental regulations. As posed by Gray (1998): “When capital is (transnationally) mobile it will seek its absolute advantage by migrating to countries where the environmental and social costs of enterprises are lowest and profits are highest. Both in theory and practice, the effect of global capital mobility is to nullify the Ricardian doctrine of comparative advantage. Yet it is on that flimsy foundation that the edifice of unregulated global free trade still stands”.

Take an example, Nike Corporation (footwear makers), in order to remain competitive, needs to reduce its standards. So, it moves to Indonesia where, through independent contractors, the shoes are made by young girls who are paid around 10–15 cents of a dollar per hour. As mentioned by Korten (1995): “Most of the outsourced production takes place in Indonesia, where a pair of Nikes that sells in the United States and Europe for \$73–\$135 is produced for about \$5.60 by girls and young women paid as little as 15 cents an hour. The workers are housed in company

<sup>3</sup> Pieces of information for this section have been taken from: Caroline Lucas and Colin Hines “Time to replace Globalization”, a Green Localist Manifesto for World Trade, The Green/European Free Alliance in the European Parliament. U.K. 2002.

barracks, there are no unions, overtime is often mandatory, and if there is a strike, the military may be called to break it up. The \$20 million that basketball star Michael Jordan reportedly received in 1992 for promoting Nike shoes exceeded the entire annual payroll of the Indonesian factories that made them”

#### **Myth 4. More Globalizations Means More Jobs**

According to the International Labour Organization (ILO) in 2000 there were 150 million unemployed in the world and 1.000 million under-employed. That means one-third of the world’s working force. The situation, as informed by ILO, tends to deteriorate further.

The *outsourcing* as described in the previous section (Myth 3) is a necessity of the big corporations in order to remain competitive. It goes without saying that such a process generates unemployment in the place of origin, and underemployment in the country of arrival.

#### **Myth 5. The World Trade Organization is Democratic and Accountable**

Many decisions affecting peoples’ daily lives are being shifted away from local and national governments and are instead being made by a group of unelected trade bureaucrats sitting behind closed doors in Geneva. They are now empowered to dictate whether the EU has the right to ban the use of dangerous biotech materials in the food it imports, or whether people in California can prevent the destruction of their last virgin forests, or whether European countries have the right to ban cruelly-trapped fur.<sup>4</sup>

According to the rules of the WTO, if a transnational corporation investing in a given country concludes that there are certain national laws or regulations considered to be inconvenient to its interest, the country is forced to abolish them, or adapt them to the satisfaction of the investor. This means that under WTO rules, the race to the bottom (described in “Myth 3”) is not only in social and environmental standards but also in democracy itself.

The WTO has no rules whatsoever about child labor or workers’ rights. Everything in its constitution is shaped to the advantage of corporations. During the discussions that gave origin to the WTO, known as the Uruguay Round, the controversial issue of intellectual property rights, for instance, was put on the agenda by 13 major companies including General Motors and Monsanto. In the negotiations that followed, 96 of the 111 members of the US

delegation working on property rights were from the private sector. It should be obvious to conclude that the final agreement serves the corporate interests and undermines poor peoples’ access to knowledge and technology. A dramatic case in point is that poor countries are not allowed to produce their own inexpensive generic pharmaceutical products, and are forced to buy the ones produced, at much higher prices, by the pharmaceutical corporations. The consequences have been particularly tragic in the case of HIV in Africa, where corporate prices are far beyond the purchasing power of the great majority of the suffering population.

In short, the WTO should be recognized not for what we are told she is, but for what she really is: an institution whose main purpose is to make the corporations rule the world.

#### **Myth 6. Globalization is Inevitable**

Renato Ruggiero, former Director General of the WTO, used to say that “trying to stop globalization is tantamount to trying to stop the rotation of the earth”. Bill Clinton pointed out that “Globalisation is not a political option; it is a fact”. Tony Blair identified globalization as “irreversible and irresistible”. Margaret Thatcher immortalized her sentence “there is no alternative”. All such statements are an evidence of the degree of fundamentalism of the defenders of the system. As a result the model amounts to a pseudo-religion.

Alternatives are obviously possible. The point is that the dominant model has been the product of the systematic renunciation, on the part of the majority of countries, of their right to control the economic processes for their own benefit. Yet, any condition that originates in political decisions is obviously reversible.

It may most probably be argued that any change would mean to choose between the present economic rules, on the one hand, or chaos on the other. This is, of course absurd. A fundamental change could be an increased re-localization of the economy at local levels, designing new rules that bring nearer production and consumption. A human scale economy.

#### **A NEW ECONOMY**

A possible alternative is a new economy based on five postulates and one fundamental value principle.

Postulate 1. “The economy is to serve the people, and not the people to serve the economy.”

Postulate 2. “Development is about people and not about objects”.

<sup>4</sup> Lucas and Hines (2002), op.cit.

Postulate 3. “Growth is not the same as development, and development does not necessarily require growth.”

Postulate 4. “No economy is possible in the absence of eco-system services.”

Postulate 5. “The economy is a sub-system of a larger and finite system, the biosphere, hence permanent growth is impossible.”

*Value principle* No economic interest, under any circumstance, can be above the reverence for life.

Going through the list it is not difficult to conclude that what we have today is, one after the other, exactly the opposite. Yet to assume that an economy based on these postulates is not feasible is absurd. It is already being practiced in many countries at the local, regional, and municipal levels. The Swedish movement of Eco-Municipalities is a conspicuous case in point.

The most important contribution of a human scale economy is that it may allow for the transition from a paradigm based on greed, competition, and accumulation, to one based on solidarity, cooperation, and compassion. Such a transition would allow not only for greater happiness among those who have been marginalized but also among those responsible of those marginalizations, *malgré* what they may believe.

Some of the new rules may be the following:

- (1) Monetary localization, so that it flows and circulates as much as possible in its place of origin. It can be shown by economic models that if money circulates at least five times in its place of origin, it may generate a small economic boom.
- (2) Produce locally and regionally everything possible, in order to bring consumption closer to the market.
- (3) Protection of local economies through tariffs and quotas.
- (4) Local cooperation in order to avoid monopolies.
- (5) Ecological taxes on energy, pollution, and other negatives. At present we are taxed for goods and not for bads.
- (6) A greater democratic commitment to insure effectiveness and equity in the transition towards local economies.

## FOUNDATIONS OF THE NEW ECONOMY

### Postulate 1. The Economy is to Serve the People and Not the People to Serve the Economy

The effects of the outsourcing described in “Myth 3,” are a clear case of humans being used for economic interests.

Any corporation that outsources its production according to the principles consecrated by the WTO, produce unemployment in the place of origin, and underemployment in the place of arrival. A great many cases of this sort could be listed.

More dramatic is the case of child and slave labor. It is unbelievable that today, in the twenty first century, there are more slaves that there were before the abolition of slavery in the nineteenth century, at least two-thirds being children. The fact that such a situation does not even reach the news, reveals the degree of perversity that the dominant economic model has been able to impose.

As mentioned by Sirota (2010), “Those of us pushing for serious trade policy reform have argued for years that businesses are aiming to create global economic policies that allow them to troll the world for the most exploitable forms of labor. As General Electric CEO Jack Welch famously said, corporations want laws that allow them to “have every plant you own on a barge”—one that can move from country to country looking for the worst conditions to exploit. Such an international economic regime would (and now does) allow the worst governments create artificial comparative economic advantages through bad/immoral policies”.<sup>5</sup>

Global business has so far opposed every effort to put labor, environmental, and human rights standards into the so called “free trade agreements”, and is doing everything in its power to weaken the laws barring products made with child slave labor. They know that the less rules exist, the more cost-cutting exploitation they can engage in; and that is what “good business” is all about.

### Postulate 2. Development is About People and Not About Objects

In relation to this postulate, I quote extensively from my book “Human Scale Development” (Max-Neef 1991).

The acceptance of this postulate leads to the following fundamental question: How can we determine whether one development process is better than another? In the traditional paradigm, we have indicators such as the Gross Domestic Product (GDP) that is in a way an indicator of the quantitative growth of objects. Now we need an indicator of the qualitative growth of people. What should that be? Let us answer the question thus: The best development process will be that which allows the greatest improvement in people’s quality of life. The next question is: What determines people’s quality of life?

<sup>5</sup> David Sirota, see: <http://www.informationclearinghouse.info/article/23951.htm>.

Quality of life depends on the possibilities people have to adequately satisfy their fundamental human needs. A third question arises: What are those fundamental human needs, and/or who decides what they are?

It is traditionally believed that human needs tend to be infinite, that they change all the time, that they are different in each culture or environment, and that they are different in each historical period. It is suggested here that such assumptions are inaccurate, since they are the product of a conceptual shortcoming.

A prevalent shortcoming in the existing literature and discussions about human needs is that the fundamental difference between *needs* and *satisfiers* of those needs is either not made explicit or is overlooked altogether. A clear distinction between both concepts is necessary.

Human needs must be understood as a system: that is, all human needs are interrelated and interactive. With the sole exception of the need of subsistence, that is, to remain alive, no hierarchies exist within the system. On the contrary, simultaneities, complementarities, and trade-offs are characteristic of the process of needs satisfaction.

We have organized human needs into two categories: existential and axiological, which we have combined and displayed in a matrix (see Table 1). This allows us to demonstrate the interaction of, on the one hand, the needs of Being, Having, Doing, and Interacting; and, on the other hand, the needs of Subsistence, Protection Affection, Understanding, Participation, Idleness, Creation Identity, and Freedom.

From the classification proposed, it follows that, food and shelter, for example, must not be seen as needs, but as satisfiers of the fundamental need of Subsistence. In much the same way, education, study, investigation, early stimulation, and meditation are satisfiers of the need for Understanding. Health schemes may be satisfiers of the need for Protection.

There is no one-to-one correspondence between needs and satisfiers. A satisfier may contribute simultaneously to the satisfaction of different needs or, conversely, a need may require various satisfiers in order to be met. For example, a mother breastfeeding her baby is simultaneously satisfying the infant's needs for Subsistence, Protection, Affection, and Identity. The situation is obviously different if the baby is fed in a more mechanical fashion where only the need for Subsistence would be satisfied.

We can now add two principles. First: fundamental human needs are finite, few, and classifiable. Second: fundamental human needs are the same in all cultures and in all historical periods. What changes both over time and through cultures are not the needs, but the way or the means by which the needs are satisfied.

It must be added that needs are satisfied within three contexts: (a) with regard to oneself (*Eigenwelt*); (b) with regard to the social group or community (*Mitwelt*); and (c) with regard to the environment (*Umwelt*).

It should be the purpose of every political, social, and economic system to generate the conditions for people to adequately satisfy their fundamental human needs. This is a paramount condition for a new economy to be coherent with the problems of the twenty first century.

### **Postulate 3. Growth is Not the Same as Development, and Development Does Not Necessarily Require Growth**

It is generally assumed that the more an economy grows, the more successful it is. The main indicator is, of course, the GDP on the behavior of which political decisions are made. A possible formula for the indicator is:

$$\text{GDP} = C + Y + \text{Gex.} + X - I$$

where *C* is consumption, *Y* is investment, *Gex.* are government expenditures, *X* is exports, and *I* is imports. It thus represents the flux of goods and services that are traded in the market through producers and consumers.

GDP has a number of shortcomings which are normally not taken into consideration when it comes to policy making. First, everything is added, regardless of whether the impacts are positive or negative. The costs of traffic accidents or of diseases are added just as investments in infrastructure or education. There is no difference between goods and bads. Second, it does not include the value of unpaid work, thus discriminating household and voluntary work which are fundamental in a society. Third, it considers only that which can be expressed in monetary terms. Fourth, Nature and eco-systems services have no value at all.

Considering such limitations, it is obvious that no assessment of quality of life or welfare can be made using the GDP. If we accept what has already been proposed, that development is about people and not about objects, and that that development is best where the quality of life improves the most, we must look for a different indicator. An indicator that should disaggregate GDP into two

**Table 1** Matrix of needs and satisfiers. Example of a possible matrix. Needs are invariant, while satisfiers can change as much as necessary

Needs	Being (qualities)	Having (things)	Doing (actions)	Interacting (settings)
Subsistence	Physical, emotional and mental health	Food, shelter, work	Work, feed, procreate, clothe, rest/sleep	Living environment, social setting
Protection	Care, adaptability, autonomy	Social security, health systems, rights, family, work	Cooperate, plan, prevent, help, cure, take care of	Living space, social environment, dwelling
Affection	Respect, tolerance, sense of humor, generosity, sensuality	Friendships, family, relationships with nature	Share, take care of, make love, express emotions	Privacy, intimate spaces of togetherness
Understanding	Critical capacity, receptivity, curiosity, intuition	Literature, teachers, educational and communication policies	Analyze, study, meditate, investigate	Schools, families, universities, communities
Participation	Adaptability, receptivity, dedication, sense of humor	Responsibilities, duties, work, rights, privileges	Cooperate, propose, dissent, express opinions	Associations, parties, churches, neighborhoods
Idleness	Imagination, curiosity, tranquility, spontaneity	Games, parties, spectacles, clubs, peace of mind	Day-dream, play, remember, relax, have fun	Landscapes, intimate spaces, places to be alone, free time
Creation	Imagination, boldness, curiosity, inventiveness, autonomy, determination	Skills, work, abilities, method, techniques	Invent, build, design, work, compose, interpret	Spaces for expression, workshops, audiences, cultural groups
Identity	Sense of belonging, self-esteem, consistency	Symbols, language, religion, values, work, customs, norms, habits, historical memory	Get to know oneself, grow, commit oneself, recognize oneself	Places one belongs to, everyday settings, maturation stages
Freedom	Autonomy, passion, self-esteem, open-mindedness, tolerance	Equal rights	Dissent, choose, run risks, develop awareness, be different from, disobey	Temporal/spatial plasticity (anywhere)

It should be noted that the matrix does not contain any material elements. So, in the column of “Having”, there are no objects; only principles, institutions, norms, traditions, etc. In conventional economics we have two links: wants and goods. In Human Scale Development theory we have three links: Needs, satisfiers and goods. For instance, there is the need of Understanding, whose satisfier is literature, whose good is a book

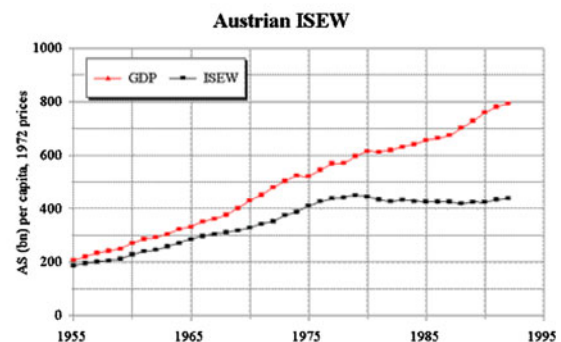
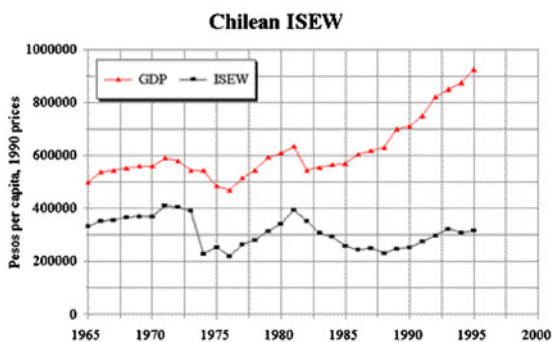
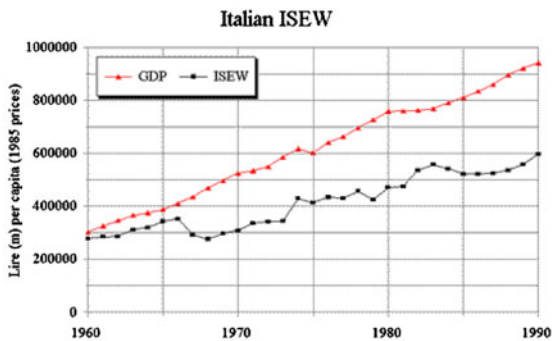
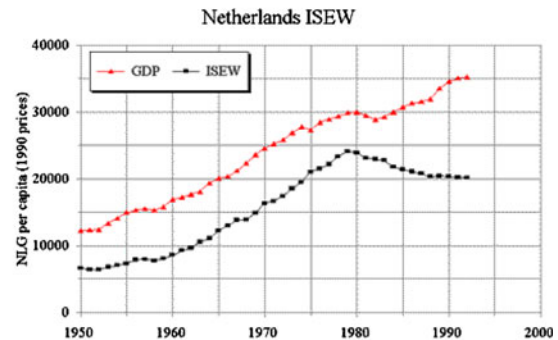
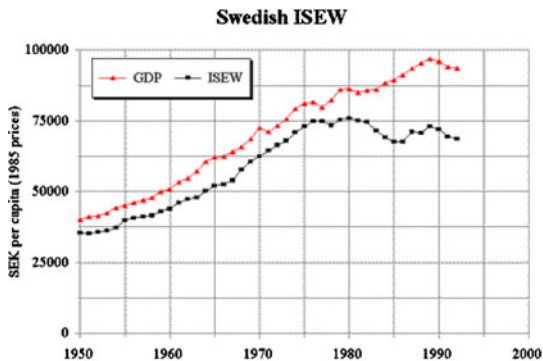
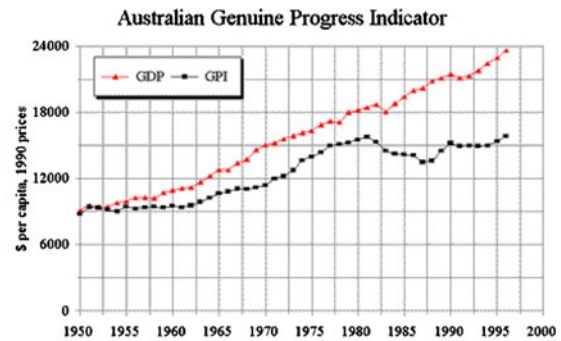
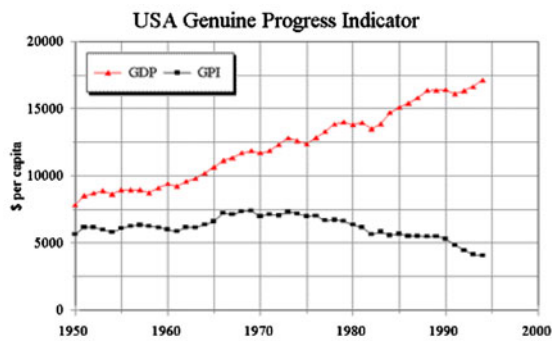
accounts: a national benefits account and a national costs account.

Concerned with this problem, a number of studies were carried out by the author and colleagues some 20 years ago in different countries, using the Human Needs matrixes in order to assess quality of life and/or welfare. In the process certain unexpected evidences begun to show up, which led us to propose what we called “a Threshold Hypothesis” which states that: “In every society there is a period in which economic growth contributes to an improvement of the quality of life, but only up to a point, the threshold point, beyond which if there is more economic growth, quality of life may begin to deteriorate”. A few months after we proposed the hypothesis, based on our qualitative analysis, a study was published by Daly and Cobb (1989), in which a new indicator called Index of Sustainable Economic Welfare, where positives and negatives are disaggregated, was proposed. Applied to the United States for a period 1950–1990, it shows a parallel increase with GDP up to 1970, and a decline after that year despite continuous increase of GDP.

As a result of our proposed hypothesis and the paper of Daly and Cobb, a number of groups got organized in different countries in order to repeat the studies using the methodology of the US paper. The threshold begun to appear in practically all cases, provoking a great debate between many economists. Several of them dismissed the findings as methodological errors, while others made constructive suggestions in order to improve the index.

After 20 years, improvements have been made, and the indicator has changed name, becoming the Genuine Progress Indicator. Many more studies were carried out, confirming the threshold. Although there are still some economists that dismiss the results, it can be stated that the threshold hypothesis is a robust hypothesis that has become fundamental in the field of ecological economics. Results for eight countries can be seen in the following graphs.

If we accept that the threshold hypothesis is coherent with reality, some significant changes should be expected in Development Theory.



Ref. Friends of the Earth, see: <http://www.foe.co.uk/community/tools/isew/index.html>

The fundamental question is: how does the economy function before the threshold point and how does it function after the point. Much analysis is still required, but a

few assumptions can already be made. For instance, if there is poverty in a country that has not reached its threshold, it is legitimate to point out that in order to overcome poverty



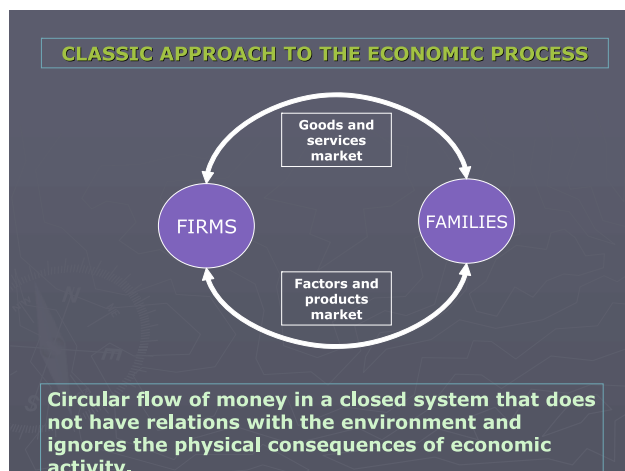
more growth is necessary. However, after the threshold such argument does no longer hold, because the economy has reached a point in which the costs of growth outweigh the benefits. In the language of ecological economics, defensive expenditures become dominant. Hence the overcoming of poverty must be the result of specific policies addressed to the purpose, since growth alone can no longer do the trick. We can identify the pre-threshold period as a quantitative economy and the post-threshold as a qualitative economy. Economic laws that function in one segment do no longer function in the same way in the other segment. Much is still to be done and investigated in order to fully understand the characteristics of post-threshold economies.

#### Postulate 4. No Economy is Possible in the Absence of Eco-System Services

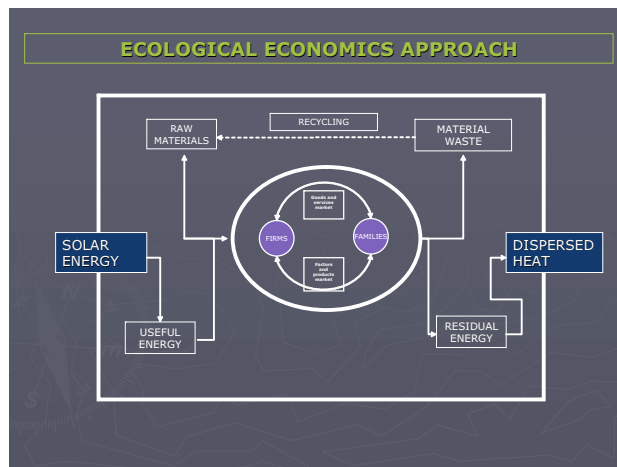
It is disturbing that the economy that is still being taught in most Universities represents a system closed into itself that has no relations with any other system. It is just a flow of goods and services, through the market, between firms and families, expressed in monetary terms, that has no relations with the environment, and ignores the physical impacts and consequences of economic activity.

As a matter of fact, if one goes through the word index at the end of any of the most important textbooks of Economic Theory, words such as eco-system, biosphere, Nature, thermodynamic laws, are nowhere to be found.

The graph that follows represents the economy as taught and as understood in conventional economic thinking.



The next graph represents the economy as interpreted and understood according to ecological economics.



While the economy depends on services provided by the biosphere, such as the supply of energy and materials, the capacity to absorb residues and the maintenance of biodiversity; it produces at the same time impacts on the biosphere in terms of dispersed energy, degraded materials, pollution and residues, increase of entropy, global warming and, as a consequence, climate change. Such being the case, it is high time that economists develop a systemic vision of economic processes and their relations with all those components of the biosphere that are responsible for the maintenance of life.

There are ten planetary boundaries (Rockström et al. 2009), all of which are affected by economic activity. They are: climate change, rate of biodiversity loss, nitrogen cycle, phosphorous cycle, stratospheric ozone depletion, ocean acidification, global fresh water use, change in land use, atmospheric aerosol loading, and chemical pollution. Of these 10 boundaries, three have dangerously crossed their acceptable limits. *In relation to climate change*, the proposed boundary of carbon dioxide concentration (parts per million by volume) is 350, and the current status is 387, while the pre-industrial value was 280. In addition, the proposed boundary for change in radiative forcing (watts per metee squared) is 1, and the current status is 1.5, while the pre-industrial change was 0. *In relation to biodiversity loss*, the proposed boundary for extinction rate (number of species per million species per year) is 10, and the current status is >100, while the pre-industrial rate was 0.1–1. *In relation to the nitrogen cycle*, the proposed boundary for the amount of N<sub>2</sub> removed from the atmosphere for human use (millions of tones per year) is 35, and the current status is 121, while the pre-industrial amount was 0. The

remaining boundaries are slowly approaching their limits as well.

This being the case, it is inconceivable that such fundamental conditions for the maintenance of life, deeply affected by economic processes, are totally absent in the economics curricula. This is the result of the absurdity that in the twenty first century, facing problems that have no historical precedent, we are still teaching nineteenth century economic theories as if there were no alternatives. No surprise that there are so many economists doing marvelous abstractions with their economic models, but do not understand the real world in which we are living.

**Postulate 5. The Economy is a Sub-System of a Larger and Finite System, the Biosphere, Hence Permanent Growth is Impossible**

Sustainability is essentially a matter of scale. That means that we must accept that we have only one planet that is finite, within a biosphere that is also finite. If in addition we recognize that anything and everything we produce can be reduced to an amount of land necessary to produce it; the question that must be answered is: What amount of renewable and non-renewable ecologically productive land area do we need in order to support the resource demands and to absorb the wastes of a given population or specific activities? The answer is the Ecological Footprint which, as a consequence of years long analysis and calculations, reveals that in order to maintain the resilience of our planet, we must not go beyond 1.8 ha per person. Yet, as the following figure shows, we have one planet but, since 1986 we have crossed the threshold, and are, at this stage, using one planet and a quarter. This means, among other things, that the renewable resources we use in 12 months, are regenerated by Nature in 18 months. That is obviously not sustainable.

Despite these evidences, known to economists, we continue with more of the same. No doubt that the great Kenneth Boulding was right when he said that “those who believe that economic growth can go on forever in a finite planet are either mad or are economists”.

Not only the ecological footprint shows that we are already overdrawn. If we evaluate economic processes in terms of energy units, instead of monetary units, we reach similar conclusions. If we know what the land budget per person is, we now need to know what the energy budget per person should be.

Searching for the answer, I proposed years ago the name ECOSON (acronym of ECOlogical perSON) for the per capita energy budget. At the time it was not clear to me how to calculate it. The answer came from German physicists. (Ziegler 1979, 1992 and Dürr 1993) who using the loss of biodiversity as a consequence of human impact on a given ecosystem as an indicator for environmental over-stress, suggested a *critical value of anthropogenic primary energy flow per unit area and time* of about

$$14 \pm 2 \text{ GJ/km}^2 \text{ day} = 160 \pm 20 \text{ kW/km}^2 = 0.16 \text{ W/m}^2$$

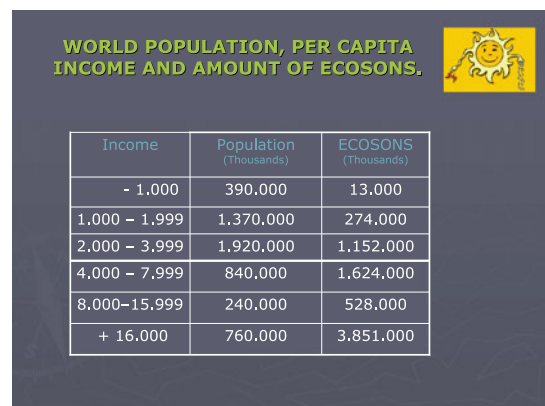
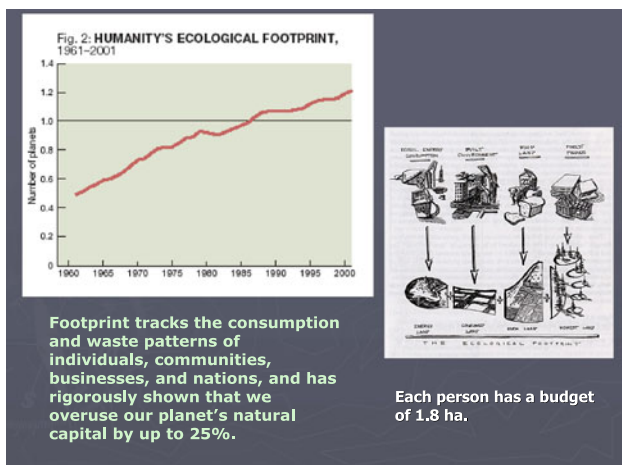
which should not be surpassed. An appropriate extrapolation yields that an anthropogenic world-throughput of primary energy of 9 terawatt is the limit in order not to exceed the carrying capacity of the bio-system of the earth. Nine terawatts amounts to 20% of the natural flow of the energy of the sun that goes through the continental biosystem.

If we divide 9 terawatts by 6 billion inhabitants, what we get is:

$$1 \text{ Ecoson} = 1.5 \text{ kw/h/pp or } 13.000 \text{ kw/h/yr/pp}$$

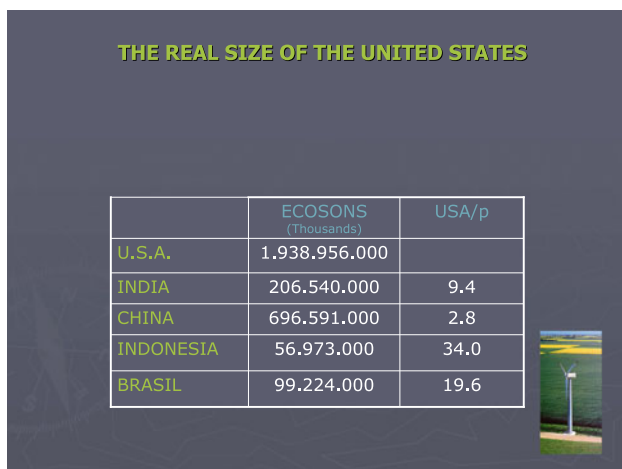
which is the energy budget per person that should not be surpassed in order not to exceed the carrying capacity of the bio-system.

The main importance of establishing the Ecoson, is that we can re-conceptualize some demographic considerations, showing that: 1 person is not = 1 person. If we classify all countries according to their per capita income, what we get is shown in the following figure:



The first line shows all countries with per capita income below US\$ 1,000, which amount to 390 million people, yet only to 13 million Ecosons, meaning that those inhabitants are far below the 1.5 kW energy budget. The first three lines represent countries with more people than Ecosons. In the next three lines the situation is reversed, and we have countries with more Ecosons than people. Of all countries the one with the greatest gap between people and Ecosons is the United States: with 300 million inhabitants, it has almost 4 billion Ecosons.

What is the importance of all this? It can be explained in very simple terms: the baby just born in Boston Central Hospital is not the same as the baby just born in a hut in Sierra Leone. They are not the same because the weight of them on the biosphere will be dramatically different. In fact one American baby may be equivalent to 10–15 Sierra Leone babies. Hence, if we are concerned with sustainability, it is much more important to know, for each country, the amount of Ecosons, because they represent the true weight of the population. To illustrate how dramatic this new way of understanding demography is, the following figure shows the true size of the United States in comparison to other countries.



The United States with its 300 million inhabitants, is nine times bigger than India, three times bigger than China, and so on. It follows that for conventional economics India and China are much bigger than the United States. However, as seen from the perspective of Ecological Economics, the United States is immensely much bigger than India and China. For those who favor population control, the message should be to control not people but Ecosons.

The calculations reveal that 6 billion Ecosons is the global energy budget in order not to upset the carrying capacity of our bio-system. According to available statistical information, the present global energy consumption

amounts to 8 billion Ecosons. Hence, just as in the case of the ecological footprint, here again we detect an overdraft of 30%; that is, we are living on 1.3 planets, having only 1.

To evaluate economic processes in terms of energy instead of money is much more revealing if our concern is sustainability.

*Value principle* “No economic interest, under any circumstance, can be above the reverence for life”.

No examples are required. The degree to which this fundamental principle is systematically violated is so overwhelming, that one can only hope that after a probable gigantic catastrophe provoked by the insistence of more of the same, a dramatic cultural shift may occur, that leads us from an anthropocentric world of greed, competition and accumulation; to a biocentric world of solidarity, cooperation and compassion with all forms of life.

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