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The Techno-Agrarian Renaissance - Introducing "The Rain Forest Model of International Economic Development" and other New Metrics for the Economy (a Work in Progress - November 2012)

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HEALTH COMES FIRST!!!, USA

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I. Embracing Health Economics in the US

Introduction

The idea of systems-based government gained popularity in the United States under the Clinton Administration but did not flourish under President William Jefferson Clinton or President George Walker Bush. This article challenges the Obama Administration and its supporters to re-examine measurement and valuation in the government and the economy in order to:

1) Promote economic policies that place human health first;
2) Allow simultaneous advancements in renewable energy and healthcare cost containment.
3) Value traditional and renewable energy sources based on their impact to human health or climate change.
4) Consider and capture benefits to future generations while simultaneously considering and capturing benefits for the current generation.

Work in these four areas is loosely called "health economics" and may be applied at the national economy level or the international economy level.

Old Linear Based Measures Are Still Used in Measuring the US Economy's Performance

To date, green policies in the US are often perceived by business as added constraints to current operations rather than as a source of exciting and profitable new financial directions. This perception is largely due to the fact that old, linear-based measures are still used to evaluate economic success in the US.

Consider the benefits of two new systems-based measurements in the US economy: 1) "cousin industry analysis" and 2) "intergenerational equity" valuations of energy. To date, industry players tend to analyze market opportunities that exist either within the linear bounds of their particular industry and/or according to old-school ideas of creating "value." Consider if industries could come together and analyze costs and benefits across a family of industries in the "Food-Energy-Health Nexus."

"Cousin Industry Analysis" – Bringing together US Food, Energy and Health Markets

Consider bringing together these US industries: Food and Beverage, Healthcare and Biofuels. These industries may be considered "cousin industries" in that prior to the present they have not been analyzed together.

Consider data from studies that correlate the use of high fructose corn syrup and increased body fat. Princeton University has evaluated this connection and found that fat content per the same caloric intake is higher when rats consume high fructose corn syrup rather than sugar.[1] Consider that corn is a critical input to biofuels with particular regard to biodiesel. Consider that the National Biodiesel Board (NBB) together with other biodiesel experts has advocated in the past that the use of pure biodiesel (B100) provides a 93.6% reduction in cancer risk as compared to petroleum diesel use.[2] The NBB and its affiliates also estimate a 96% reduction in hazardous waste generation in the production of biodiesel as compared with that of petroleum

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[1] http://www.sciencedaily.com/releases/2010/03/100322121115.htm (hereafter cited as "*Princeton HFCS Study*").

[2] *Biodiesel Educational Workshop*, sponsored by the Iowa Soybean Promotion Board, National Biodiesel Board, National Renewable Energy Laboratory, United Soybean Board, USDOE, September 1999. Section L, P.10. Hereafter cited as *Biodiesel Workshop*.

diesel.[3] These figures are mitigated by the fact that new retrofits on biodiesel vehicles sharply reduces their illness risk profile, however, one can assume still assume a positive impact on cancer risk reduction associated with biodiesel manufacture and use. This impact remains to be measured to date.

When "Food-Energy-Health Nexus" industries are evaluated traditionally, we might find that Coca-Cola and other US Food and Beverage players experience huge losses as information surrounding corn syrup and health issues proliferates. On the other hand, when "cousin industry analysis" is used to evaluate impacts and advances common to all three markets (food, energy and health), we might find these results:

1) Health risk of diabetes and/or weight gain may be reduced as HFCS is eliminated and raw sugar or other sweeteners are reintroduced into food products[4];
2) Health risk of high blood pressure may be reduced as HFCS is eliminated and raw sugar or other sweeteners are reintroduced into food products[5];
3) Health risk of cancer risk may be reduced as biodiesel replaces or leads production over regular diesel[6];
4) Health tax credits may be issued to Food and Beverage players such as Coke for:
   - Diabetes risk reduction
   - Weight gain reduction
   - High blood pressure risk reduction
   - Cancer risk reduction.

In addition to these health risk reduction scenarios, additional market advances may include:

1) New markets developments for renewable energy, specifically biodiesel;
2) Minority ownership development in biofuels.

Food and Beverage players may actually serve as investors in new energy models.

"Intergenerational Equity" as a Concept

"Intergenerational equity" refers to the idea that we want to preserve "the public good" for our children and their children. If fossil fuels are harvested and used at the current rate, we may find that their supply is not guaranteed for future generations. Additionally, the use of fossil fuels in the present generation may be associated with environmentally induced illnesses and/or climate concerns. The goal of "intergenerational equity" policies is to ensure that: 1) energy sources remain available to future generations; and 2) the healthiest production/use of energy sources is pursued within each generation.

What Happens When "Value" Is Attached to Renewable Inputs? Perhaps most crucial to consider in adopting systems-based measures for the economy is new economic valuation of energy sources, including both renewable energy and traditional energy sources. To date, energy market players can claim "value" in their production processes as raw energy sources such as fossil fuels are processed into petroleum and/or related fuels or by-products. Currently, renewable resources like sunlight, wind, biomass, geothermal as well as traditional energy resources like oil and coal are measured as they are converted into power at some intermediary level.

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[3] *Biodiesel Workshop*, Section N, p.25.

[4] *Princeton HFCS Study re weight gain. Diabetes risk is not included in the Princeton HFCS study but is extrapolated here.*

[5] http://www.drweil.com/drw/u/WBL02172/High-Fructose-Corn-Syrup-and-Your-Blood-Pressure.html (hereafter cited as "*Dr. Weil HFCS*").

[6] *Biodiesel Workshop.*

Consider what would happen on the books of traditional and alternative energy players if all the sudden we were to "value" the existence of renewable energy sources such as sunlight, wind, biomass and geothermal. Consider if we were to value the mere presence of these alternative sources into perpetuity or as long as the earth is in orbit with the sun. Rather than just "valuing" energy as it is produced, we could attach "value" to the mere existence of energy sources. *Virtually overnight, solar, wind, biomass and geothermal are captured on the books into perpetuity. Rather than giving ourselves credit for using up our traditional energy sources, we would actually provide ourselves credit for developing and preserving energy in the healthiest manner possible.*

Under these new rules, oil or coal reserves, when valued on the books as a future resource, may prove to be more valuable as future equity than as a current harvest. Instead of encouraging us to process the most oil or coal possible, new measures would place value on saving oil or coal until a time when their processing would be cleaner or healthier.

Finance and Nature in Harmony, Intergenerational Equity Success - Recognizing sunlight, wind, biomass, and geothermal as renewable energy resources and thereby sources of present and future equity means we are honoring "intergenerational equity" in our energy markets. The timeframe we use to value our natural resources moves from the-present-time to a timeframe that includes future generations. *All of a sudden, economic value is based on the existence and continuation of natural resources rather than their depletion. Energy assets may move from x to infinity times x. Finance and natural resources are in perfect harmony.*

Who are the Techno-Agrarian Producers?

This allegiance between finance and nature creates a new opportunity for our financial systems to evolve and honor the successes of our agricultural and energy farmers. Farmers here includes agricultural workers engaged in food security (along the community-sustained agriculture / CSA model[7]) as well as those farmers engaged in alternative energy production. It may be that farms can be utilized for both food and renewable energy production simultaneously. Under this model, we may advance food production simultaneously to the production of solar, wind, geothermal or biomass. Farms, termed "Nouvelle Fermes," seek to correlate advances in food and energy security by adapting valuable farmland for multiple uses. The emergence of a farm-first model is at the core of the "Food-Energy-Health Nexus." It is also a key requirement of a "Techno-Agrarian Renaissance."

If "Nouvelles Fermes" were to advance in the US, it might be easiest to see how such farms would develop around energy hog cities such as New York, Los Angeles or Atlanta. "Nouvelles Fermes" would exist in "Satellite Settlements" around the circumference of these major US cities and would be tasked with providing 51% or more of the food and energy needs of their sister cities. "Satellite Settlements" would be organized in such a way as to minimize transport costs of food and energy as well as energy inefficiencies associated with long commutes over the grid.

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[7] "Assessing Sustainability Claims: Key Factors in Case Studies," by Jo Margaret Mano, SUNY New Paltz, presented at the Society for Values in Higher Education Annual Conference July 2010 in Portland, OR.

Summary: the "Techno-Agrarian Renaissance"

In sum, the United States is blessed with a wealth of natural renewable resources. By simply measuring renewable resources in the United States differently, we can make pronounced progress in the fields of health economics and alternative energy market development. By valuing both renewable and traditional energy sources differently, we progress the economy by correlating what is good for the environment and what is good for human health.

By applying lessons learned from technological advances regarding energy processing from the 1970's forward, we foster the development of a "Techno-Agrarian Renaissance." This "Techno-Agrarian Renaissance" may be pursued at the national level in the US and/or abroad. Instead of food and energy farmers being forced to fit into an antiquated Wall Street model, the concerns of food and energy farmers are brought to the forefront. Financial measures in this light work with farmers' concerns in a "Techno-Agrarian Renaissance."

II. Health Economics at the International Economy Level

Introduction

It is probably true that as long as the nation-state measures its economic success under old school financial silo models, the international economy will continue to evaluate its success along the same lines. Until systems-based measures can be evolved nationally, health concerns will continue to be presented as by-products or externalities with little room for economic recovery into "the public good." In addition, farmers (of food and renewable energy) will operate largely as sub-players rather than as strategic players.

That said, there is ample room for the worldwide economy to evolve a similarly robust set of measures as nation-states simultaneously evolve their measures. Concepts presented as relevant for the international economy include:

1) "Cousin industry analysis;"
2) "Intergenerational equity" and new valuation strategies;
3) "Nouvelles Fermes" organized in "Satellite Settlements"

In addition to these concepts, "The Rain Forest Model of International Development" is presented as an important model for taking health economics to the worldwide economy. "The Rain Forest Model" is backward compatible with health economics and human capital concerns at the national economy level.

"Cousin Industry Analysis" - International Economy Example

Consider the surpluses, shortages and by-products in food, energy and health when evaluating US and African concerns. In general, American populations have a

surplus of inexpensive food particularly of cheap beef, pork and chicken while African nations have a shortage of these and other foods. In addition in the US, "leveling the burn" associated with a wide variety of biomass inputs may present challenges to the agrarian food and energy "Nouvelle Fermiers." While at the same time in Africa, biomass players may be isolating the existence of an "African Aloe" very adept at "leveling the burn" associated with most waste-to-energy inputs.

Under an international "cousin industry analysis" framework, when food, energy and health entities are analyzed together, we might find:

1) Cheap food surpluses in the US may be needed in Africa;
2) African aloe may be needed in the US and other developed nations;
3) Biomass inputs including sugar cane waste and other agricultural waste products may be diverted to the home nation (Africa) or affiliate nation (USA) biomass production.
4) Illness-impacted animal carcasses as well as animal waste in the home nation (Africa) or affiliate nation (USA) are disposed of safely via a biorefiney model.

In this way, food, energy and health considerations in Africa and the USA may be analyzed together. Considering African and US concerns under the same umbrella is loosely called here "spheres of influence." In addition to African-US concerns, "spheres of influence" at the international economy level may also include developments in these additional spheres:

- India and the UK;
- Indo-China and France;
- Latin America and Spain/Portugal.

At a minimum, these "spheres of influence" establish partnering opportunities for technology transfer from more developed nations to less developed nations. In addition, rain forest and other natural resources in less developed countries may be more strategically managed as nations begin to partner around long-term as well as shorter-term economic goals.

"Spheres of Influence" and "Intergenerational Equity" in International Markets

Under a "spheres of influence" model, advanced economy players are expected to be engaged in these "intergenerational equity" type concerns:

- Provide a leadership role for example in sustainable harvesting of natural resources from rain forests or other such natural blessings or wonders.
- Play a leadership role in reforestation of whatever natural resources are being harvested such that these resources remain available for future generations.
- Provide resources and/or communications around ensuring the coordination of legal considerations at the tribal, town/city, state/county/province, nation-state, international levels.

Under a "spheres of influence" model, underdeveloped or developing nations are expected to be engaged in these "intergenerational equity" type concerns:

- Collaborate regarding sustainable harvesting of natural resources from rain forests and other natural areas.
- Collaborate regarding reforestation goals of natural resources being harvested.
- Seek to develop laws that integrate concerns at the tribal level on up to the nation-state and international level.

When nations are grouped by "spheres of influence," it may be that trade developments and natural resources harvesting are more likely to occur in a manner which is sustainable.

The Rain Forest Model of International Economic Development

The Rain Forest Model of International Economic Development ("The Rain Forest Model") is explored in full to help illustrate how governing entities at the nation-state and international levels can work together to measure and promote change. This change is primary in new health economics measures.

III: The Rain Forest Model of International Economic Development

Health Economics at the International Level

"The Rain Forest Model" serves to provide a working model for worldwide economic development with the following characteristics. The model:

1) places "health economics" at the forefront of national and international concerns;
2) advances energy and food markets in a way that optimizes health;
3) grows the overall worldwide economic "pie;"
4) employs the expertise of seasoned political leaders to foster economically and environmentally safe and viable fiscal activity.

The Rain Forest Model has four discreet components that work together in a common system. These components are:

- The Canopy Layer;
- The Emergent Layer;
- The Understory Layer; and
- The Ground Layer.

In addition to these four layers, nation-state based Commissions or Commissioners exist at the Ground Layer to incent safe migration from a static Canopy / static economic state to a more dynamic international marketplace.

Current Multinational Economy as Canopy Layer

Consider the multinational economy and its activity as the Canopy Layer. Observe that there has been little emergent behavior since World War II save perhaps the rise of the "dot coms" in the 1990s and/or the rise of the pharmaceutical industry in the 1980s. In the existent model, this Canopy Layer has been allowed to dominate so long that there is little visible Emergent Layer behavior.

Consider as a prime example energy market developments since 1950. In the 1970s, the United States was virtually ready for the Canopy Layer to give way to new alternative energy technologies in the Emergent Layer. However, financial and

political leadership did not promote these developments. Instead, leadership over the last 60-70 years has sponsored either actively or passively an extension of traditional energy players' dominance in the Canopy Layer. This extension of traditional energy players' dominance may be associated with such concerns as global climate change and other environmental or human health hazards.

Movement in the Canopy Layer Allows for Emergent Layer Developments

The static nature of the Canopy Layer over the last 60 to 70 years further can be seen as a sign that the overall forest or the overall economy may be poised for an overarching negative event if change is not adopted. Climate Change experts may see this overarching event as the advent of increased natural disasters such as tsunamis and floods and/or increased risk of animal-to-human borne illnesses. Human Capital experts may see this overarching event as the persistence of famine and disease in underdeveloped nations. When considering the economy as a dynamic system, observers may characterize the current Canopy as static. In this climate of economic stasis, fiscal advances become more and more likely to rely on black markets, monopolistic forces and/or other aberrations of a malfunctioning economy.

To be truly growth-oriented, the Canopy must allow for the transition of less-performing Canopy Layer players to new growth in the upcoming Emergent Layer. To provide for new growth in the Emergent Layer, some old Canopy players must fall. These felled trees allow sunlight to reach into the forest and attract new Emergent growth and Understory advancement. Simultaneously, important advances in human health and environmental protection may be promoted as the Canopy transitions its make-up.

Canopy Layer Movement Also Allows for Understory and Ground Layer Developments

In a developing forest, it is understood that Canopy players have a set lifespan; they are not intended to exist at a dominant level into infinity. If long-standing dominance is preserved for the few, the overall forest ceases to grow and/or becomes threatened by overarching disease or natural catastrophe. When political advances extend the life of Canopy players unnaturally, the overall economy becomes at risk. In a healthy rain forest, Canopy players fall from time to time.

As a Canopy tree falls to the ground, several important things happen:

- Sunlight reaches the Understory Layer and the Ground Layer and encourages new and healthy growth;
- Emergent Layer players have an opening through which to advance equal to or greater than the old Canopy;
- With biodegradation of the fallen tree, the Ground Layer is replenished with important "nutrients" (or in this case research and information) for the growth of all trees at all levels.

These "nutrients" may be considered as important information for advancing "cousin industries" nationally or internationally. As an old Canopy player falls, data surrounding that industry or that company sifts down to the Ground Layer and provides fodder for new, more progressive economic growth at all levels.

Emergent Layer Distinctions and Example

An important distinction should be made when characterizing the Emergent Layer. Emergent Layer players are not considered to be those trees or companies that are bigger than the Canopy. Instead, new Emergent Layer players are considered as those companies that are smarter or more agile than the existing Canopy players. Instead of relying on old linear based models of economic success, Emergent Layer players engage in new cross-industry economic analysis or "cousin industry analysis." This Emergent Layer is informed by such concerns as climate change, civil society, energy security and food security to name a few. Emergent Layer players actually create value out of unwanted by-products such as illness or climate impacts and create new markets by combining analysis of here-to-fore unrelated industries.

Consider again the advancement of the biomass industry where corn inputs for biomass have been recovered from inputs to food and beverage production as an example of Emergent Layer behavior. The swap (from corn as a sweetener to a biofuel input) promotes the development of alternative energy markets while simultaneously lowering the overall population risks for various illnesses including cancer, diabetes, weight gain and high blood pressure.

Another important distinction of Emerging Layer players is that they may be local, national or international in scope. Again, it is not their size that characterizes them as above the Canopy. It is their information-rich, waste-wise behavior in the marketplace. In other words, these players are excellent systems-based performers. They may advance by making simultaneous inroads for example in human health and/or in protection of the natural environment including climate.

Old Canopy Players May Evolve into Emergent and/or Understory Players

In the current evolution from old growth Canopy, it may be that old growth Canopy players reorganize themselves in a variety of ways. As old Canopy players learn to develop markets with systems-based approaches, they may be candidates of or sponsors for Emergent Growth. At the same time, Canopy players may also find that certain markets previously pursued at the Canopy level may be better pursued at the Understory Level. The Understory Level in this new model is where those industries with a national or local economy reach (not an international reach) are poised.

As an example, consider the case of Chevron, geothermal and traditional oil markets. Chevron is currently an old Canopy Layer player. Should Chevron make a dedicated advancement into geothermal and partner with several other non-Canopy players to make this happen, Chevron could move from the Canopy Layer to both the Emergent and Understory Layers. As Chevron embraces geothermal and new systems-based approaches and partners with new market players, Chevron becomes an Emergent Layer player. As Chevron dedicates its traditional oil production to fuel inputs for developing biorefineries in US markets, Chevron's oil markets may fall back to the Understory Layer. As Chevron finds local markets for its oil production for fueling biorefineries, it may retain oil market participation but at the national Understory Layer instead of the old Canopy Layer.

Critical Nature of the Understory and Ground Layers

The Understory and Ground Layers are crucial for securing growth in the overall forest or economy. The Understory Layer serves to prime players for new, Emergent growth as a Canopy player falls and provides room for industry advancement. The Ground Layer serves to inform players at the Understory Layer which are ready to advance past the Canopy to the Emergent Layer. The Ground Layer further seeks to regulate Emergent layer behavior such that Canopy fells are controlled (rather than pursued across the entire Canopy at one time).

The Ground Layer in the new model is considered a pre-incubator zone. It is ultra-information-rich and seeks to promote the advancement of market players at every level who are ethically inclined and oriented to furthering the growth of the overall economic pie. The Ground Layer is not so much "the bottom" as it is the location of nutrient-rich soils or information-rich analysis for the development of the most healthy trees in the forest. In our budding economic model, this Ground Layer is made up of nation-state governments, international government agencies, policy organizations, NGOs and all those vested in fostering economic activity that honors human capital, human health, environmental protection and other non-linear or systems-based advances.

Advent of Rain Forest Commissioners by Nation-State to Govern the Forest Growth

This article promotes the adoption of Rain Forest Commissioners to govern at the Ground Layer. These Commissioners:

1) oversee the development of Emergent Layer players;
2) monitor the extent to which Canopy players fall or recede and thereby create Emergent opportunity;
3) ensure that vital information at the Ground Layer is circulated as Lessons Learned throughout the forest ecosystem / international economy;
4) link political and economic agents to address global concerns such as climate change.

Commissions from all participating nation-states are recommended as Ground Layer organizations. In this model, Commissioners would work closely with World Bank and other leadership to ensure that Canopy layer developments are regulated.

Commissioners serve to promote economic activity in the Emergent layer that promotes the interests of national as well as state and/or tribal leadership. Commissioners work to develop laws that promote human rights and other advancements at the local, tribal, state, national and federal levels. For the purposes of this article, US Commissioners might include former Presidents Bill Clinton and George W. Bush. The vast political experience of these leaders as well as other similar leaders around the globe would help to ensure a functioning matrix between international politics and international finance.

Success of The Rain Forest Model Is Its Systems-Approach

The success of The Rain Forest Model is not found in the development of any one layer but in the fact that the various layers work together in an ecosystem or system. At all times, the failures and successes of market players at all levels are reviewed and evaluated by nation-state based Commissioners at the Ground Layer such that

Lessons Learned inform newer, more robust market activity. This robust activity is characterized by the recovered value of waste products such as negative impacts on human health or on climate considerations. It is associated with human health/human capital advancements, and win-win economic developments for tribal and non-tribal peoples in each nation-state and/or federation.

IV. Closure/ Summary

The "Techno-Agrarian Renaissance" at Home and Abroad

With new measurement systems, multinationals and their smaller competitors are challenged to grow smarter and/or more sustainably. They are also challenged to evolve in ways that limit unwanted health and other by-products such as climate impacts. In this light, systems-based measures such as "health economics" are considered vital and not just a "nice to have" option.

The starting point for developing these systems-based measures and health economics is the "Food-Energy-Health Nexus." By adopting such practices as "cousin industry analysis," "intergenerational equity" analysis and metrics from "The Rain Forest Model," we create and deliver the "Techno-Agrarian Renaissance."

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Volunteer Attendance at Board Meetings and related discussions of the Atlanta Local Food Initiative from spring/summer 2010 forward.

"Will There Be Enough? – 3 Big Ideas to Make Water Last," Yes! Magazine: The Water Solutions Issue, various articles by various authors including Sandra Postel, Jane Braxton Little, Robert Kennedy, Jr./Interviewed by Sarah von Gelder, Arturo Sandoval, Frederick Kirschenmann, Alice Outwater, Maude Barlow, Elizabeth Grossman, and Tara Lohan (Summer 2010: Issue 54, pp. 18-40).

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