

BUILDING UP A PROSPEROUS WAY DOWN IN BRAZIL

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Abstract

The world's situation demands a systems diagnosis to identify what is wrong with the interaction of economy and nature to steer us in the search for solutions. The book "A Prosperous Way Down" of H.T. and E.C. Odum was written with this purpose, it can help us deal with the transition to a new stage of Human Civilization based on renewable production and consumption patterns. Nevertheless, the experience in Brazil with the application of the ideas in this book made us realize that their recommendations are adequate for Northern Hemisphere countries, where people have access to land, money stocks, political representation, education, but not in the Southern Hemisphere where people suffer strong oppression from dominant classes, through ideological frameworks provided by laws, media, schools, universities and religious systems. During transition, scientific communities from the North should join efforts with Social Movements of the South that have similar future perspectives, but may differ in theoretical and philosophical perspectives. It is necessary to identify some points of convergence in order to work together in a synergic way: (1) We should move to a low (fossil fuel) energy system, but at the same time, to a high renewable energy system; (2) We need to substitute the main beliefs of a destructive neo-classical economy by ecological systems principles strongly concerned with social issues. Even the capitalist system has a great inertial moment, at the same time, the Earth's biophysical system is reaching, or even over-riding, its resilience limits, such that no more growth is possible; (3) The anthropocentric approach should be overcome, because environmental services depend on the existence of habitats for other species; every species and every human-being is as important as the other one, no matter where they live and what they do; (4) The capitalist culture should be fully understood in order to be substituted by other cultures able to effect Earth's recovery; (5) In the South there is no a consensus about Population Decrease as well as in the North there is not a consensus about Consumption Reduction. Probably, both are economic competition forces. No nation will agree to reduce both if the other countries do not do the same. The solution of this impasse involves social assets redistribution, adoption of ecological forms of production and consumption and relocation, therefore a massive and revolutionary global transformation; (6) It is important to participate, in a convenient form, of important global actions as the Climate Change Movement, proposed by the Indigenous People Meeting in Bolivia, as well as the Global Degrowth Movement discussed in Europe.

Keywords: Prosperous Way Down, resilience, Biosphere, Climate Change, Global movements.

Introduction

The ideas expressed in the book "A Prosperous Way Down" are very important and could be very useful in the transition we are living, but it is difficult their application (in any country). Here we discuss these difficulties and also how to overcome them. Presently in Brazil the more attuned discussions and concerns to these ideas are the national programs that finance industries and research institutions to study and apply means to reduce CO₂ emission, and the payment for environmental services to rural properties owners. Most people ignore Odum ideas, including those that think and write about future scenarios in different public and private organizations. We think that the same thing is happening in other countries. Why? Probably because the people that agree with Odum ideas do not use Internet resources in a pro-active form and in an adequate language for most of the population. Even some futurologists who know Odum do not use his ideas and privilege

other points of view, probably they consider that Odum ideas are not viable in an global economy that is driven by capitalist forces. Other motives could be: difficulties to understand the concepts of life cycle analysis and total aggregated energy, or emergy, and lack of courage to incorporate the values of negative externalities in economic accounting that demand a socially critical perspective.

Brazilian Parties positions compared with Odum proposals

Table 1. Identification of Odum main ideas

The main ideas for the future contained in the book “A Prosperous Way Down” (Odum e Odum, 2001).

General Vision 1	Social and environmental reforms to establish a transition from Capitalism to a Social System based on Sustainable Communities. Regional programs for an ecological ruralization (Gunther, 2004)
Agriculture 2	Integrated agricultural and agro-ecological systems, with recycling to maximum renewable carrying capacity. Rural production surplus allows developing small size towns. Rural systems will incorporate people that emigrate from cities and rural areas affected by lack of fuel, population growth, pollution and Climate Change. Incorporation of negative externalities and of areas of environmental services and absorption of environmental impacts.
Industry and Commerce 3	Proposals for new short-cycle transformation chains with equitative distribution of overall benefits.
Environment 4	Recovering of ecosystems, recuperation of native forest species in agricultural systems. Mitigation of and adaptation to the effects of Climate Change.
Education 5	Education is complemented by the perspective of System Ecology and Political Ecology.

Table 2. Broad vision of Brazilian political parties (Odum points of view, % of vote intention)

PSOL: Socialism and Freedom Party (Odum ideas: 1, 2, 3, 4)	PV: Green Party (2, 4)	PT/PMDB: Workers Party / Brazilian Democratic Movement Party (only 4)	PSDB/DEM: Brazilian Social-Democrats / Democrats (none)
Important Social Reforms within Capitalism (1%) Emphasis on Agrarian Reform and Human Rights. Promotes peoples mobilization for a decisive role in the country’s management. The vision is of a Democratic Socialism, akin to ecologic causes which it considers complementary. There is no explicit long term perspective, which affects policies for the differing sectors of the economy and for nature. The proposal for education is to improve the present system with greater overall public access.	Qualified Growth within Capitalism (11%) Support to national entrepreneurs in the various sectors of the Economy. It presents a vision of Green Capitalism, without a position in relation to the Agrarian Reform. Implementing procedures for socio-environmental certification of the different production chains and units. Searches for a special treatment of the Amazon Region.	Competitive Growth within Capitalism (54%) Neoliberal politics with a certain precautions. A consortium of entrepreneur groups with good relations with Government, Trade Unions and some social movements. Negative growth factors are not considered within a proposal for development. Economic policy favors a vision of competition with other countries for the global market. Partial opening towards international capital for the production of biofuels. Lack of knowledge and criteria to define what would be sustainable	Subordinated Growth within Capitalism (27%) Practices strictly neoliberal politics, with no limitations, with a strong connection to the great international capital. It doesn’t consider negative growth factors. Favors a vision of alliance with the countries which dominate the global market. Total opening to international capital to produce biofuels and mineral extraction. There is no interest to study the issues behind Sustainable Development and doesn’t consider the issues of Climate Change.

Only two parties (PSOL and PV) show coherence with the Prosperous Way Down ideas but both have small chances to obtain the power (12% of votes). PT/PMDB and PSDB/DEM have 53 and 27% of votes.

Table 3a. Analysis of Political Parties Programs in relation with climate change and resilience loss: (A) Direct correlation; (B) Indirect correlation; (C) Negative correlation.

<p>PSOL Socialist and Freedom Party</p> <p style="text-align: center;">A</p>	<ul style="list-style-type: none"> • Re-discussion of the Decennial Energy Plan, aiming to adequate it to the requirements for the reduction of Green House Gases emissions; • Anticipation of deadlines and increase in the goals of CO2 equivalents emission reduction in the National Plan for Climate Change; • Incentives for fast public and non-polluting transport, moved by renewable fuels and support to the creation of bicycle networks in Brazilian cities; • Incentives for public transport vehicles rather than individual automobiles; • Tax increase on manufacturing and Sales of polluting vehicles and/or consumers of fossil fuels; • Maintenance and betterment of the Brazilian Forestry Code; • Ecological Agrarian Reform to combat desertification and mitigate the effects of the draught in the semi-arid region.
<p style="text-align: center;">B</p>	<ul style="list-style-type: none"> • Changes in the present Forestry Law, substituting it by one that might guarantee the concession of forests for sustainable management practices, by cooperatives and riverine, extractivist populations, rural communities of black slaves descendants (<i>Quilombolas</i>) and small farmers without concessions for large national and multinational capital; • Re-nationalization of the electricity sector, with financing to end transmission distribution and energy consumption losses; • End of subsidies to the great energy consumers, amplifying the scope of the social energy tax; • Universalize the access to water, which must be recognized as a fundamental right of every human being and should be offered by the State, thus reverting privatizations in this sector, with the public management of water and the guarantee of its social control; • Use of the social taxation for water and energy use, increasing tariffs for the large consumer industries; • Recuperate and amplify the national and urban railway networks, linking it in large cities with metros and pre-metro systems. • Incentives for an intermodal transport system which fosters the rational use of waterways.

Table 3b. Analysis of Political Parties.

<p>PV Green Party</p> <p style="text-align: center;">A</p>	<ul style="list-style-type: none"> • Development of alternative energy sources: use of solar energy and stimulus to technology transfer to reduce costs and enhance performance; • Incentives for research and application in wind, geothermic and tidal energy sources.
<p style="text-align: center;">B</p>	<ul style="list-style-type: none"> • Proposes a policy for a sustainable energy matrix based on the economy, on the end of tax privileges and on the adoption of clean, efficient and non-polluting technologies; • Better use of natural gas, in transportation, construction of natural gas plants, with a price reduction for transport and energy generation; • An aggressive implementation of a national economic program for the energy sector, involving distribution networks, equipment, industrial products and home utilities; • Construction of small size hydroelectric plants such as mini-dams and subaquatic turbines; • Halting construction of new nuclear power plants, including Angra dos Reis.

Table 3c. Analysis of Political Parties Programs in relation with climate change and resilience loss: (A) Direct correlation; (B) Indirect correlation; (C) Negative correlation.

<p>PT Workers Party A</p>	<ul style="list-style-type: none"> • Strengthening of international initiatives to implement a new global agreement to further actions for tackling the process of Climate Change; • Adjusting the Brazilian energy matrix with the increase of production and use of clean and renewable energy sources.
<p>B</p>	<ul style="list-style-type: none"> • Consolidating the paradigm change for the promotion of sustainable development of the Amazon and its furtherance for the remaining Brazilian biomes; • Intensification of integrated policies for the combat against deforestation; • Promotion of policies for the reduction of energy consumption, with technological innovation and combat against unnecessary waste; • Strengthening of Brazilian environmental legislation; but supporting the flexibilization of the Forestry Code; • Widening of the scope of specific programmes for the protection and sustainable use of Brazilian biodiversity; • Perfecting the integrated management of national water resources; (polemic projects such as the transposition of the São Francisco River and the construction of great dams); • Priority of planning actions is for the promotion of integrated urban and environmental policies.
<p>C</p>	<ul style="list-style-type: none"> • Stimulus to the creation of industrial centers in the areas of biotechnology (favorable to the liberation of transgenic seeds) and agribusiness.

Table 3d. Analysis of Political Parties Programs.

<p>PSDB/DEM Brazilian Social Democratic Party/Democrats A</p>	<ul style="list-style-type: none"> • Support to Brazilian participation in international agreements to reduce global warming risks and to deal with their consequences. • Focus on implementing zero deforestation rates – the drastic reduction of the cut-and-burn of forests – applying the strength of all existing legislation against offenders.
<p>B</p>	<ul style="list-style-type: none"> • Considers that deforestation must be contained as much as forest burning; • Save from destruction the precious Amazonian and Atlantic Forest (Mata Atlantica) biodiversity is an issue of both national and global interest.
<p>C</p>	<ul style="list-style-type: none"> • For its coalition with the DEM, a large part of its declarations are questionable, as DEM fosters as its basic principle the maintenance of agribusiness as the main economic centerpiece. Defining “agribusiness” as the sum of three decisive factors: production + technology + commercialization; • Favorable use of transgenic crops; • Works to elaborate a flexible Forestry Code, reducing present requirements; • It is against agrarian reform and, therefore, to land redistribution, a fact which would help the decrease in land concentration and the process of re-ruralization; • It makes no reference to the change in the energy matrix; • There is also no mention to a plan of water management.

The vision of large enterprises concerned with sustainability

Large corporations also present their proposal for Sustainable Development: the “Vision for 2050 Project”, developed by the World Business Council for Sustainable Development - WBCSD. This organization integrates 29 large enterprises concerned with the future within their growth-centered vision and proposes a timetable of changes, starting now until 2050. Their project establishes a pathway which will require changes in governments’ structures, in economic guidelines, in business, enterprise and citizen behavior. The proposal states that these changes are both necessary and viable; offering great business opportunities incorporating sustainability in their practices. The project aims to find answers for three questions: How would a sustainable world be like? How could we achieve it? What role can the entrepreneurial sector play to advance more rapidly towards this goal? The proposals for the sector for 2050 listed in the WBCSD document include:

- **An entrepreneurial leadership:** to become a defending agent for actions of sustainable development.
- **Policy Development:** to help develop new policies creating benchmarks for entrepreneurial contribution to sustainable development.
- **Practical Studies:** develop and promote entrepreneurial cases for sustainable development.
- **Better Practices:** to demonstrate entrepreneurial contribution to sustainable development and share better practices between members.
- **Global Reach:** contribute for a sustainable future for developing regions and regions in transition.

In short, WBCSD proposes a model which articulates complex alliances for socioeconomic development involving the private sector, NGOs, related to paradigms that structure and establish new and complex alliances. It proposes a consumer awareness rising for the acquisition of low-impact products, establishing a connection between consumers and enterprises. Information and communication technologies will play a significant role within this environment, allowing consumer access to product information, reevaluate their opinions, sharing amongst themselves and with the firms that develop and sell their products. It therefore reinforces the strategy of continued growth, with greater responsibility. It also uses an example from the World Bank, where a country with a solid development, which achieved 10 more mobile phones for each 100 people, would further its GIP by 0.8%. Thus still promoting the idea of economic growth!

Climate Change or Climate Disaster

According to KlimaForum (2010) the rapid world climate changes, with increasing calamities, could lead to the elimination of various human communities and of biodiversity thus proposing the reflection that calling them climate changes is practically to manipulate a reality, as we are in fact living a climatic disaster.

Anthony Giddens, apud Leite (2010) one of today’s most influential sociologists and the main ideologist of the Third Way, searching for an alternative between radical liberalism and traditional social-democrat-state tendencies, turns his attention to the theme of global warming already admitting the need of a strong action by the State and of greater regulatory measures, of a longer range planning than in the past, to more effective market control mechanisms than in the last 30 years. He evaluates that “we are in the initial stages to discover what might be a new model of capitalism which is responsible and global” and foresees a convergence in the debate on the great recession and on the challenges of climatic change. Giddens also defends the idea that rich countries have to bear 95% of the costs in the fight against global warming within the next years, as “it isn’t morally correct nor would it be practically feasible to impede the developing countries to develop”.

We thus have to clarify the difference between growth and development, to be able to advance in the discussions towards urgent decisions. The development of a society depends on the way in which it profits from the benefits of its economic performance, which is a subsystem of natural resources, to distribute opportunity of access to common goods: civic liberties, health, education, decent jobs. According to Veiga (2010), therefore, prosperity will also have to consider the environmental sustainability of this process. Thus the belief derived from economic growth which has been fostered for decades, Sunkel and Gliglio (1980) apud Veiga 2010 had as its premises:

- a) Faith in unlimited exponential economic growth;
- b) The possibility to sustain on the long term a style of development based on export of natural resources;
- c) Conduct geared to accumulate the maximum of natural goods for consumption;
- d) The advantages of urban concentration;
- e) Indiscriminate faith on scientific and technological progress and its unrestricted capacity of artificially reproducing nature;
- f) The possibility of compatibility between the high consumption levels of industrialized countries and of high-income groups of undeveloped countries and that of obtaining similar consumption levels for the great majorities.

A human dilemma

The human specie should develop an internationally coordinated program very rapidly, clearly conceived, fair and flexible, to reduce the population in the next centuries (CAIRNS, 2003). This effort will likely require a global population shrinkage of at least two-thirds to three-fourths, from a probable, mid-to-late 21st century peak in the 9 to 10 billion range to a future (23rd century and beyond) “population optimum” of no more than 2 to 3 billion.

Resources and Population Changes (number of people, renewables consumption and life style)

Good quality of life for everyone is the goal when considering population, whether in the North or South. As fossil fuels are used up and become more expensive, everyone will learn to live with less. Knowing how much we must cut down can help us plan ahead.

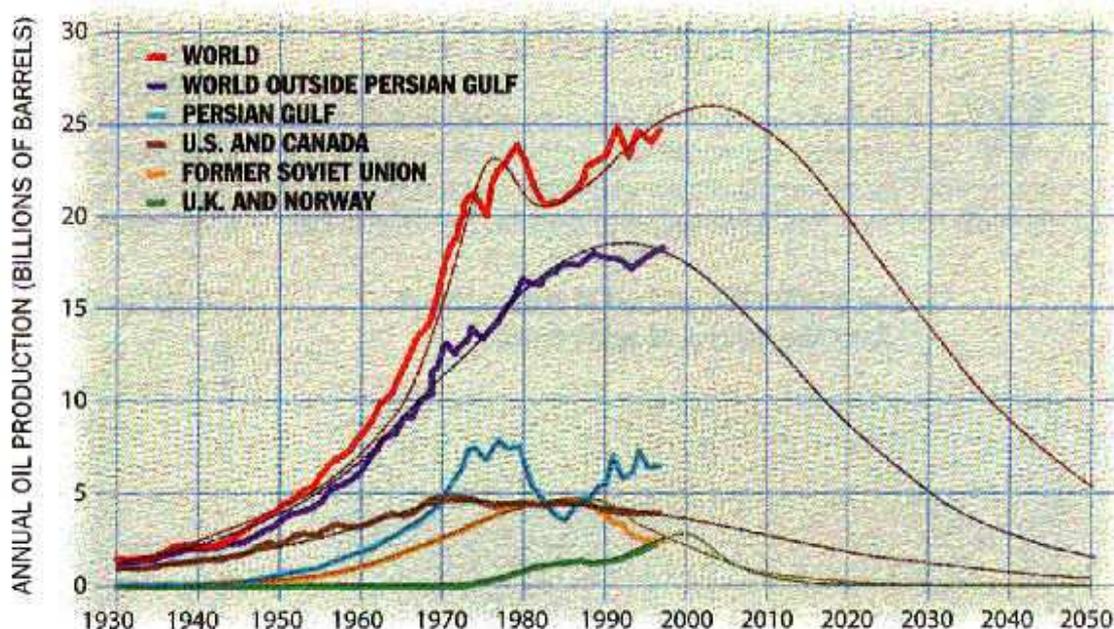


Figure 1. Graph from a Gas and Oil Industry report shows world oil production peaking in about 2004. Oil is the major nonrenewable source of energy (Campbell, 1998).

We are beyond the peak of fuel production.

Disasters like the oil spill in the Gulf of Mexico and Iraq war are examples which show that oil extraction and drilling deeper in the earth and farther out at sea, uses more energy than it produces.

One way to measure of quality of life is resource use per person.

To measure resources and their use is by emergy¹ calculations. The ordinary measure of standard of living is money per person, but money does not include the whole economy. The money flows (Gross National Product) do not include factors as sun, wind and rain. Emergy is a measure of total resources including money, and also sun, rain, and wind.

Emergy per person is a more inclusive measure of the “standard of living” in a country.

Emergy use can be divided into renewables and nonrenewables. Renewables have constant flows, such as sun, rain, wind, geological uplift, tide, and deep heat. Non-renewables include materials that are being used up, such as oil, coal, natural gas, uranium, and other minerals. The realistic measure of standard of living includes the calculation of the use of all these.

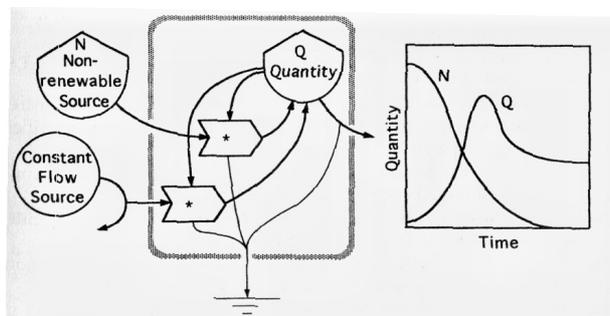


Figure 2. Civilization (Q) uses a constant renewable flow (R) (sun, rain, wind) and non-renewable fossil fuels (N). When N is used up, Q survives using only renewable resources (R).

As the economy uses up nonrenewables, it will depend more on renewables. By calculating the total emergy use of a country now, and then **what the emergy use will be when the nonrenewables are gone**, we can envision the changes: (a) if a country’s population remains the same as emergy use decreases, the emergy per person will become less; (b) **If the population decreases at the same rate as the emergy use decreases, the emergy per person can remain the same**. The following table shows how much emergy will be available as nonrenewable fuels and minerals are used up. We calculate future standard of living by renewable emergy per person. Table 4 gives values for several countries. **Emergy per person** now is the total emergy use of the country divided by the population. When the country is living on renewable energies only, the emergy per person is the **renewable emergy divided by the population**. To calculate how much the population must decrease to maintain the same emergy per person, the percent renewable energies are of the total emergy is calculated. That percent reveals the population that can be sustained on renewables only.

Table 4. Calculation of sustainable population using Sahel Project database (2007).

Country	Population	Total emergy use seJ/y	Renewable emergy use seJ/y	% on renewable	Renewable emergy use seJ/y/person	Sustainable population
Argentina	39.786.850	2,91E+24	2,31E+24	79%	5,81E+16	31.583.376
Brazil	192.924.506	7,07E+24	3,53E+24	50%	1,83E+16	96.325.814
Venezuela	26.814.843	1,03E+24	3,93E+23	38%	1,47E+16	10.231.294
USA	308.758.000	1,88E+25	2,27E+24	12%	7,35E+15	37.280.886
Portugal	10.669.883	9,44E+23	3,92E+22	4%	3,67E+15	443.071
Italy	60.231.214	4,14E+24	6,75E+22	2%	1,12E+15	982.031

Using this table, we see that:

- Countries that are now more rural and less industrialized will have to make fewer changes.
- Since Argentina uses 79% of renewables, it will only need to decrease its population by 21%.
- Brazil will need to reduce its population 50% to maintain its present standard of living based on renewables consumption (not total consumption).
- Venezuela is an intermediate case, without fossil fuels should decrease its population to less than half the present value.
- However, the United States will have to reduce its population or its energy per person by 86%. Many in the United States realize their energy use per person is excessive. They are trying to cut down wasteful use.
- The worst cases are those of Portugal and Italy that should decrease their population in great number or their level of living could diminish enormously.

Reduction of the use of non-renewables

There are many proposals for reducing our dependence on nonrenewables. A recent indigenous convention wrote this:

“We call on States not to promote commercial monoculture practices, nor to introduce or promote genetically-modified and exotic crops, because according to our people’s wisdom, these species aggravate the degradation of jungles, forests and soils, contributing to the increase in global warming. Likewise, megaprojects under the search for alternative energy sources that affect Indigenous Peoples’ lands, territories, and natural habitats should not be implemented, including nuclear, bio-engineering, hydroelectric, wind-power and others.
“(World Peoples’ Conference on Climate Change and the Rights of Mother Earth)

Most proposals for the transition combine some reduction in wasteful use of resources and some reduction in population.

Ideas suggested by E.C. Odum (2010) that could be successful in all the countries, in the North as well as in the Southern Hemisphere.

1. Decrease urban concentration;
2. Increase rural villages with families living on the land;
3. Build sturdy basic housing;
4. Increase low-intensity (ecological) agriculture around the villages; use fewer machines and share what you have; less fertilizer and pesticides; more human labor - can come from the unemployed in the cities;
5. Encourage communities with diversity of nationalities, with each keeping special cultural values;
6. Organize enough government to give every person a basic safety net of food, housing, education, and medical care;
7. Reduce dependence on cars – communication can replace transportation;
8. Encourage smaller industries using less fuels;
9. Decrease unearned income, stocks, loans, bonds;
10. Cut down on luxuries and waste;

11. Educate for a diversity of jobs, with internships;
12. Encourage women to become educated, own property, establish businesses, make reproductive choices - in many countries, this has resulted in fewer children and stronger families.
 The Degrowth Conference in Barcelona in 2010 put out this statement concerning population. "Denouncement of top-down population control measures and support of women's reproductive rights, conscious procreation and the right to free migration while welcoming a decrease in world birth rates; (Degrowth Declaration Barcelona, 2010)
13. Maintain stable families and values - fewer children, decreased resources, and fewer cars;
14. Do not produce anything that cannot be recycled or reused;
15. Develop trade equity, based on emergy calculations;
16. Share information world-wide;
17. Maintain natural environment – this will be hard with increasing pressures on water, soil, fish, and forest resources

An introduction to the question of global governance:

Who would lead these changes? Not the corporations with the vision to sustain growth and maintain the capitalism even with more responsibility if the governments are held hostage by them?

A paradigm change is essential for life to continue (Comar, 2005). A civilization based on the three interrelated components of ideology, organization and technology is not sufficiently guided in its rightful development, unless the concept of transcendence pervades the ideological component. Governments have to change their perspectives towards planetary partnership and renewable resource use; scientists must cease to connive with materially oriented market forces; economists stop viewing competition as the only value, and environmental processes just from a consumer-based perspective; education needs to quest for fundamentals, for social inclusion, for virtues. Commercial exchange and international relations will have to use emergy values for agreements. Planning organizations will have to acquire this new perspective using transparent participative processes. Teaching and research institutions will have to offer solutions for priority issues, whose very nature will force them to structure multidisciplinary teaching and research methodologies, socializing results and redirecting efforts towards mass communication and demystification of scientific knowledge. Our cities or conurbations must give place to more modest settlements, sustainably inserted within their ecosystems. Their internal functional and spatial organization must allow us to rediscover urbanity, the sense of belonging, of cultural identity, within a humane scale. This requires a political will and a continued and profound public consultation process with adequate channels and tools. Resources drain from poor to rich countries cannot be subsidized by scientists. New integrated systems, within a new scale, must be sought within the agro-ecological movement, respecting the need and wisdom of natural cycles, producing for local and regional needs, according to ecosystem characteristics and within more cooperative forms of management. World unity and global governance must be considered as the pivotal conceptual benchmark of a newly acquired human consciousness. Not a type of unity which would force all to a monotonous cultural conformity, but a spiritual thrust engendered on the belief of the intrinsic nobility of the human spirit. Something which will awaken the most subtle melodies of the kaleidoscope of human experience and creativity which the various and subsequent civilizations have entrusted us. A new moment in mankind's development, where superior values and attributes, surprisingly still alive in the human spirit, will gradually give form, revealing mankind's full potential, overcoming the rebel, bigoted and covetous posture of a deranged past adolescence. Where human beings rival to achieve unprecedented heights of service, not just for knowledge by itself, but for an ideal of perfection that could take us to our destiny: peace and community.

Nowadays, there is also the important idea of transformation of The World Social Forum into the Fifth International (Amin, 2005, 2008; League for the Fifth International, 2010).

Conclusions

It is difficult to change any country by means of the political system as it structured at present moment, but the analysis made can help us to identify political parties and institutions that are more close to Odum ideas that could be open for dialogue, or at least to establish individual contacts.

It is necessary to publish Odum books in other languages. An effort in this sense is now in course in Brazil.

It is necessary to create an international network about Prosperous Way Down book ideas using internet resources (for example: Wikipedia) in many languages with sites in all the countries, all of them with freedom to discuss local issues but also able to integrate efforts as a unique network.

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