

## THE PAPER OF THE TECHNOLOGY AND INNOVATION FOR THE PROPOSAL OF PROSPERITY WITHOUT GROWTH.

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### **ABSTRACT:**

The present article wants to argue as the technology and the innovation is seen by different chains of economic thought and which the imperfection of the ideologies that deposit in the innovation the great exit or solution for all the ambient challenges that we face in search of the sustainable development. Which its key conditions, which its reach? What are the limits of the technologies and innovation for the reach of a developed, healthful and happy society?

Key words: sustainability, limits, innovation, technology

### **1. INTRODUCTION**

The present article starts for tracing a general panorama of issue Economic Development and Environment to locate the general picture of the quarrel. After that, it comments with bigger depth the one of the last materials of the bibliography - recent publication of the Sustainable Development Commission "Prosperity Without Growth" (Jackson, 2009). This publication, that deserved compliments for its extension and format of construction, tacks some subjects and debates related to the sustainability and looks for to trace suggestions to make the transitions for a sustainable economy. Its study it is interesting, therefore the publication if lines up to the thought of the ecological economists and still it deals with including form some inherent aspects to this transition, being the technology and innovation only one of these aspects.

By the way, is necessary to make a clarification on how the sustainability is faced by different lines of economic thought and the reasons for which I believe in the chain of the ecological economy. For this, the article of the professor Jose Eli da Veiga, details with rare simplicity and clarity this point. To follow I try to trace a parallel between these lines of thought and questions about the ecosystem limits - subject key for the distinction between chains.

Finally, coming back the publication of the PWG, I detail the proposals of transition for a sustainable economy, detaching the three important dimensions suggested by the commission, namely: the construction of a macroeconomics that stimulates the sustainability, the protection of the capacities of flourish of the individual and the respect to the ecological limits.

The conclusion is that the question of the technology/innovation "the easier one" of being understood because its more tangible character, measurable and encourageble. Already the social and cultural dimension of change in the (exaggerated) standards of consumption is extremely complex because the common thought already present in mind of people of measuring status, happiness, honor, through the ownership of material goods and properties. The third dimension - construction of a macroeconomics that also contemplates the environments questions has its complexity based on the "traditional and inflexible knowledge" of the economic mainstream who perhaps does not want any change in the current *status quo*. Because of those things, the technology and innovation must be seen as complementary to the others tasks and not like the only "rescuer" of a economy that wants to remain itself closed in favor of the illusion of the continuous growth.

### **2. ECONOMIC DEVELOPMENT AND ENVIRONMENT**

The first question to address this issue is to understand the economic development of the nations from a perspective of use of the natural resources and the underlying models. With

this objective, we start for analyzing the implications that the effective model of economic growth had brought in ambient and social terms and the impossibility of its generalization for all the countries given the limitations of scale of this model. Authors as Arrighi, (1997), Abramovitz (1989), Sen (1999) and Veiga (2005) had been important to show the main drivers of the development of the today more advanced countries and also to point that a new conception of development is necessary in such a way to incorporate missing aspects in the current model how much to surpass the limitations of resources that the previous model needs.

In the second part the quarrel was on the specific factors that had stimulated the growth of the nations. Diamond (2003) discourses on the paper that the weapons, the embryos and the steel had had in this direction. It argues that "history followed different routes for the different peoples due to the differences between environments where they lived and not due to the biological differences between the peoples".

Mokyr (1990) argues the paper of the innovation and the technological advance arguing that the humanity innovates less than is possible because in the majority of the time we are not in "border zones" as wars, disasters, etc... where scarcity of resources tends to awake the creative and innovative potential of the people. He affirms, moreover, that the economic growth does not happen only because of the innovation that other factors if make necessary for the dissemination of the good happened fruits of the innovative process as investments (increment of capital supplies), size of the markets (that alone it does not represent nothing) and commercial expansion (that it brings I obtain a beneficial increment of good exchanges, services and work).

In the third part of the course the approach was on the concept of sustainable development. Given to the limits and challenges where we find in them, what should be the institutional and cultural first conditions for the change of paradigm in the standards of consumption and style of life? In this point, special attention was given for the presumptions of economic theory that are based on the instrumental rationality and the absence of ecosystems limits.

In the last month of course, "we were happy to know and received" the recent publication of the British commission for the sustainable development - Sustainable Development called Commission or SDC "Prosperity Without Growth" This book, fruit of an ample research and quarrels that had lasted 2 years, try to analyze the main aspects and consequences of the current paradigm of a economy with infinite growth.

### **3. THE PROPOSAL OF "PROSPERITY WITHOUT GROWTH"**

The text of Jackson (2009) starts describing the current financial crisis as fruit of all sort of thoughts, paradigms and cultures that attributes the stimulation to the increasing consumption as basic mechanism of economic growth. It's not only a isolated habit of some individuals or nations, but it is structuralized in the proper form of thought of the current societies.

Because of these, becomes necessary to redefine what prosperity is. This term is related to the happiness (something intangible). However its metric concrete and they are related to the acquisition of good of indefinite and increasing form. The conclusion is that the prosperity goes beyond the material sustentation. It has social and psychological dimensions as to give in receiving love, sense of belonging to a community, etc...

But the incorporation of these intangible dimensions does not guarantee that the prosperity without growth is possible. In fact, some defenders still see the growth economic as required want either because the material opulence is necessary for this flourish, or because the economic growth closely is correlated with good as health, education and prosperity or still because the growth is useful to keep the social and economic stability. This dilemma is really uncomfortable. However to ignore its consequences still can be worse.

One of the used arguments “to attenuate” the concern with the subject is the idea, more or less easy to accept, of the dissociation between the economic growth and necessity of material resources. About the truth one thinks that it is possible to continue growing established in the fact of that it has a decline in “throughput” material. To clarify this point the authors make the necessary relative and absolute distinction between decoupling and show to us clearly that this dissociation cannot be used as route of escape of the quandary of the growth, therefore do not have historical or mathematical evidences for in such a way.

In the chapter about the consumerism, the authors describe the “vicious circle” where we are and where the increasing consumption is used in such a way to attende our “new” social necessities how much to foment the growth economic. Actually, all this anxiety created to consume finishes functioning in favor of the continuous economic growth, dimming the question about the environment limits of the system.

In the following chapter the authors point how the current “consensus” of recovery of the crisis, based on the Keynesian ideas of public expense and cut of taxes, can also be used to prepare our society for more sustainable age. In fact, investments in green technologies can obtain excellent results for long term to change the energetic matrix of the countries, to create a economy of low carbon, to generate new jobs etc... But we have to take care not thinking that this strategy can alone bring us again to the paradigm of the continuous growth. Here, the necessary macroeconomic question of new elements and structure. Although we don't have a complete theory, the authors explore 2 dimensions of the subject: a) the possibility of obtaining the macro economic sustainability since that it assumes some conditions and where the key point of success is the job politics; b) the change of the energy base. In short, the new macroeconomic theory must finish with the fool separation between economy, society and environment.

This rank, part of the problem is addressed, but not all of it. The logic of the consumerism still needs to be modified and the authors illustrate some situations and initiatives that go against this logic. But it is not easy to assume a simpler life among the society, full of material symbols of status. Because of that is necessary a structural change to revert the logic of the consumerism. And this must, in such a way, be made by the end of the perverse incentives for the unproductive competition on status.

In this scene, the role of the governments needs to be reviewed. With intrinsically conflicting interests, the governments have the paper at the same time to protect the property partnerships and ecological in the long stated period and still to guarantee the macro economic stability of the nations. What is not clear until now is that, becoming free itself of the blind objective of the economic growth, the governments go better deliveries the social and ecological objectives of long stated period.

Finally, the publication points the necessary steps to make the transition for a sustainable economy. These steps are grouped in 3 sets: the 1) construction of a sustainable macroeconomics; 2) the Protection the capacities of flourish or another logic to think prosperity and 3) the respect to the ecological limits.

It is exactly in this last block of ideas that the text touches in the question of the technological innovation as tool of confrontation of the ecological limits. Before however go deep in this topic, we go to understand which better the current chains of economic thought and as they face the current debate on sustainability..

#### **4. THE DIFFERENT VISÕES ON SUSTAINABILITY AND THE PAPER OF THE INNOVATION IN EACH ONE OF THEM**

The quarrel, today frequent, about the necessity of alterations in the economic theory that take in account the environment limits of the planet is not free of misunderstandings. The notion of system and subsystem is the framework for the debate and source of misunderstandings. For those who imagine that economy can grow indefinitely, the environment is a lesser subsystem of the economy. For others it is the economy that is inside the social life and therefore the economy is a subsystem of the ecology. For all them, the innovation or technological progress

has important paper, but distinct. According to Veiga (2009), it has 3 well distinct positions: conventional, ecological and the third way. In the first position the thought chains meet derived from the classic economists and that they are the current one they mainstream. As they consider the economy a closed and independent system of the environment, they act as a lawyer that we do not need worrying about this, therefore after has a “natural way” of ambient recovery a period of depletion. Thus, it would be justifiable to degrade for growing and to develop and later the recovery if it would give in an analogous standard to the curve of Kuznets of course.

Here the desirable innovation is the one that mere has purpose of profitability increase. It does not matter that new processes or products are invented, the important one is the result in terms of profitability added for the capitalist system.

The opposing side, of the ecological economy, says that we can only reach sustainability in a condition of “steady state economy”, in a condition where the society developing itself without necessarily increasing the use of the natural resources. Here the desirable innovation is that one that get to increase the productivity of the use of the natural resources (attenuating the negative impact), to create conditions that “let us make more with less”, if possible, to diminish the environments damages previously provoked (positive impact). The logic of the profit is not absent of this thinking, but it is submitted to the logic of the ambient and social preservation, to the public interest and the agreement of that economy is a subsystem of the environment and needs to respect its limits. The theoretical greater of this thoughts is Herman Daly that for many is called radical, antidemocratic and anticapitalist.

Anyway, the crudity and reality of the constant facts in his theory, although the unpopularity of its recommendations, bring some theoreticians whose objective is to construct one third way theory, capable of keeping in such way distant of the cynical illusion of that they believe the growth without limits, and too far from the ecological pessimism appeared that imposes ways said impracticable for these. According to Veiga (2009), this group of thinkers:

“(...) they bet, then, in gradual reconfiguration of the productive process in which the supply of goods and services would tend to earn in eco-efficiency: dematerializing themselves and being each time less intensive in energy. The economy could then continue to grow without ecological limits were breached, or natural resources came to deplete.”

This idea, that has been called “decoupling” attributes to the technology a role of “rescuer of the planet”, and with this prevents the dilemma of the growth being between the two previous chains. Here, the desirable innovation also is submitted the ambient bolter as for the ecological economists, however, differently of them, not with the intention of recognition and respect to the limits, but as chance and motivation to surpass them.

On the other hand it also aligns with the conservatives economists when use the capitalist logic of the own market is who will direct, will give price, and then, it will stimulate the necessary developments to each time for the confrontation of the environment limits.

Let’s agree that it is a line of “more easy” thought of being accepted since fondles the ego of the man who imagines to be able to dominate the nature and still put out the question of the limits that we have submitting for the second chain. Not a coincidence that this thought was growing more until the report “Prosperity Without Growth” came to evidence with numbers and facts that the profits of efficiency in the energy use do not reduce scales. It mined thus the main argument of the “Third Way” and compelled us to face the dilemma of the growth.

## **5. LIMITS OF THE INNOVATION AS SOLUTION FOR THE GROWING/DEVELOPMENT**

An another form to approach the 3 visions it analyzing the limits for each of them .

In the conventional vision, the ecosystemic limits are not recognized by the economy. Actually we can see the economy as a closed and independent system of the biosphere. For them, the

resources can be replaced *ad infinitum* for other sources and who determines that rhythm are market prices of those same resources. Simple like that.

In the ecological vision, the limits exist and must be respected since they are of certain form unreachable (for unrecognizable, intangible which they are in some aspects) and it recognizes the finitude of the planet, the biosphere, the natural resources at last. Here the role of the technology and the innovation is coexisting those limits better, that is, recognizing them and at the same time managing to maximize the use of the resources for a good quality of life for all.

In the third way the limits also exist but, "they are there to be exceeded" as an incentive to the creative process of the innovator. What the research of the PWG brings is that it is not possible to increase efficiency without increasing scale. E moreover, the man already exceeded the "load capacity" of the planet.

The third way as the conventional one deposits in the innovation an absolute faith in the capacity to transgress the limits and resolve the question of the development and welfare of the nations.

## 6. THE ECOLOGICAL VISION OF SUSTAINABLE INNOVATION AS TOOL FOR THE PROSPERITY

The report of the PWG aligns itself to the ecological vision and exactly by recognizing those limits it understands that the technology/innovation cannot be the only strategies. It is necessary addressing other questions as a new macroeconomics that does not drive the countries to blindly search the economic growth and a new culture and social logic that drives our search for development and happiness (from "having" to "being").

Report PWG groups the recommendations in 3 fronts:

- a) **Construction of a macro sustainable economy** that does not depend on an expanding the throughput. For that is says:
  - Construction of economic instruments that are capable to interact with the environmental variables such as the research that explores the demands for investment associated to the sustainable economy, indicating on the implications of restrictions to the emissions, evaluation of impacts on the natural assets etc.
  - Investments on jobs, assets and infrastructure that prepare the bases for a sustainable economy. Here the focus is in the education for a new type of work, in the conservation and improvement of the existing assets, preparation for the infrastructure of sustainable basis (investments in transport, energies, civil construction and others)
  - Increase of the fiscal and financial prudence - this to redirect these resources of a consumer purpose (either for the consumer either for the financial investor) for a more productive and lasting purpose.
  - Improvements in the macro economic accounting - Construction of metric capturing the welfare improvement in the nations, to incorporate indicators for the inequality in the income distribution, social costs of the pollution, reduction of the assets of the extraction of material resources among others.
- b) **Protection of the Growing Capacities** – It is the most complex challenge, because it depends on the cultural change of billions of people. This group of new suggestions intends to give horizons and objectives so that the people if feel happy. To leave the logic of having that to consume to seem "adequate" for the logic of the significant participation of the life in the community. The recommendations are 5:
  - To reduce the work load: this would in such a way help of the point of view of more ranks of work and little unemployment (with impact in the economic stability) how much also of the point of view of bigger balance in the relation family work. For this the

biggest tax incentives to the work are necessary part teams, end of the discrimination to this type of job project, minor valuation for companies who adopt the project, etc.

Measurements of the prosperity - It is clearly that the GIP is not a good pointer of prosperity of the nations. The construction of a new measure that caught the improvements of social dimensions as life expectancy, education, welfare state, etc... is an effort that needs to be undertaken so that let us obtain to change the mental model of measure the progress only for the economic aspects.

- To attack the systemic inequality - the inequality provokes some types of social damage and must be fought with re-distributives mechanisms, maximum and minimum revision in the structures of taxes, levels of wages, guarantee of access the education of quality for all.
  - Reinforcement of the capital stock and human. If to understand that the participation of the life in society is the way of the true prosperity, we need to fortify the structures so that this participation happens. E this goes since the construction and maintenance of public spaces where this convivência can occur until the education for abilities and learning for this “more long” life. That is, the life in community must be fortified and the governments must offer to all the necessary resources for in such a way.
  - To revert the culture of the consumerism - This culture was here until the service of the economic growth straightforward. We now need to redirect the efforts to finish with the materialistic consumption and unproductive competition for status. This can be made through strong regulation on the commercial media, protection to the consumer in what it says respect the durability, sustainability and commerce just of the products, end of the propagandas directed to the children, etc.
- c) **Respect to the Ecological Limits** - To establish the clear limits for the use of the natural resources and to integrate these limits with the social and economic functions are essential. Then, the technological progress and innovation, inside of this ecological vision, must be subsidized by
- Definition of the ceilings of use of resources and emissions, gradual reduction of these limits of resources you did not renew, definition of capacity of per capita emission and wastes. A time established these ceilings, them must be incorporated the macroeconomic politics;

The fiscal Reformation for the sustainability - to tax the good production not only but also the production of ambient impacts (as pollution for example). This would provoke the internalização of costs that today are shared by all the society and also the aiming for better activities with practical ambient.

- To promote transference and ecosystemic protection technological so that the nations poor (and anxious for progress that raises the level of life of its populations to a satisfactory minimum) reach the welfare still inside of the ecosystemic limits of the planet.

Thus the technology and innovation only go in fact to serve to the sustainable development in efficient, equitable and perennial way.

## 7. CONCLUSIONS

The analysis of all the boarded elements above makes us to understand that we have the elements and we must use to advantage the current moment of the humanity to give this qualitative jump in the welfare and quality of life of the nations.

- We can say that we are right now at a time of border, as it defined Mokyr, where the resources are scarce and where the creativity and innovation have more potential to flourish;
- The capital liquidity is so much that new fronts of productive investment (and green) can and must be created in a new Green New Deal with perennial results for all the humanity;
- Already we have know how enough to start this new challange (in terms of available technologies to address great part of the current challenges);

What it lacks exactly are the elements less tangible: the cultural question of the consumerism as social standard and the new macroeconomic theory that of sustentation for all the investments that if make necessary. These two groups of action, already explored for report PWG are basic and most challenging.

Hands the workmanship!

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