

11TH CTV

back to the sense of the city

VIRTUAL REALITY OF THE SUSTAINABLE IMMATERIAL URBAN NETWORKS. SIMULATION CO-BENEFITS APPROACH AS AN STRATEGY TO SURVIVE IN THE DYSTOPIAN CITY

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Abstract

In order that we can create cities that can adapt quickly to change, we can look at the co-benefits as a strategy for a fast implementation in a view of the contemporary city that want to have immediately results in a smart position in the information age.

On the premise of an individual transformation point of an ecological baseline to the highest collective level, a city must be planned and adapted to provide itself with minimal dependence and in a neutral equilibrium with the nature. The co-benefits will help us to decrease the correlational break between economy, society and nature, under an inclusive environment of highest social inclusion.

Using the theoretical approach of Foladori, Castells and Smith, and making use of virtual tools of modeling and simulation; we can confirm and anticipate, which are the better strategies to be employed in the actual macro contemporary city. This network model is like a strategy of transformation for the environment and the huge impacts made in this global, dual, faster, green and smart time.

Objective

Propose a conceptual close up of the co-benefits as a strategy to survive in the dystopian city, through the simulation and modeling of the better and the worst scenarios that could represent the conceptual, virtual reality of the sustainable immaterial urban networks.

Opening

The deep transformation of the actual world and their imperative interchange of services and goods, create a lot of questions not only in the way on the livelihood population ever increasing, but also on the mechanisms on which that support is possible, with an equitable basis covered on the principles of social justice and balance with an encroaching environment and decreased

resources (Yory, C. 2004:15).

So to reflect the question of what can we do arise from this, do we need to anticipate the change? is the change anticipating us? How can we adapt to our reality? Is the reality adapting to us? And how can we survive in the age of the dual and dystopian transformation?

It is necessary to understand the concept of virtual reality and urban network and how it arises in this new paradigm through the information technology (IT).

While intangible sustainable urban networks will be link to this paradigmatic process, characterized by this new communication system based on the digitalized and interconnected integration of multiple modes of communication, which include and cover all cultural expressions in multimedia communication system according to the mention made by Castells, M. 2011. 407.

In his book the network society vol. 1; this new communication system transforms the space-time and also reintegrate it into functional networks or collages of images, a space of flows that replaces the places space in the city, and is also able to re-configure the sustainability urban network to add a dynamic, planning process under the premise of the social, and economic preservation of our planet.

In this process of constant change and seeing this from an historical point of view, this new communication system, organized in the electronic integration of all modes of communication, it is not an induction of virtual reality, it is the virtual reality. It is virtual in practice, and it is real because has a real existence. The reality as an experience has always been virtual, because it is always perceived through symbols formulating practice with some meaning. Virtual reality is a system where the same reality is complete captured, submerged and packed in a scenario of virtual images in the world of making believe, where appearances are not only on the screen through which it communicates the experience, and become experience (Castells, M. 2011: 405-406).

The development of the ability of prospective thinking seeks to generate long-term visions, to know the different currents of thought on the study of future and apply it to different areas of knowledge, emphasizing the design stage and proposed strategies for construction (Gandara, G. Osorio, F. 2014: 24).

It is necessary to use this approach to place ourselves and anticipate the purpose of configuring a close up of the co-benefits approach; based on the current necessities to anticipate the changes, the vulnerabilities and environmental, economic and social pressures, through a real, sustainable, and intelligent approach. For that reason has decided to handle the co-benefits approach as these come to offer a new opportunity for development and management of win-win policies through co-benefits between developers, residents, the environment, and through policy measures that provide immediate and measurable actions, which biases left by the proposed approach to sustainability and likewise be diminished is introduced as a method of preventing the current problems in terms of planning urban, sustainable growth, shrinking cities, as well as poverty reduction, risk, vulnerability and inequality, accessing vital resources under a model of inclusiveness and social cohesion.

It is important because the ability to develop systematic and global views is essential to understand the multifunctional complex of elements that condition and determine a greater or

lesser degree in the future of an object of particular study. This whole process has the objective to facilitate the generation of multidisciplinary intelligence in the generation of alternative futures in a short and long term, immaterial and intangible urban dystopian city networks, dual, global, informational, green and smart.

Understanding it better, the current problems in cities, not only comes from the loss of sense of belonging caused for the globalization impact, the enormous social contradictions, or the economy. It is also a problem the increasing migration to the cities, and as Yory (2004) tells us, by the inability of adopting new policies about the urban development and the sustainability. It is necessary to resolve situations of lack of governance, poor conditions of habitability, poverty and low economic productivity.

This is why it is important to understand how we can approach to the conceptual perspective of co-benefits as a strategy to survive in the global dystopian city; that would allow us to anticipate change without it anticipating us, first and from the perspective of a systematic approach and a comprehensive strategy based on a win-win for everyone.

The methodology used is constituted under the premises of the prospective development and it is based on the regulatory approach of the quantitative-qualitative method, the study consists of 4 phases: 1. understanding the context (problem tree method); 2. Visualizing the strategy (SWOT); 3. Drawing the future (prospective SWOT); 4. Building the Future (bet modeling scenarios).

Making with this a conceptual perspective that focus on the co-benefits and immaterial sustainable urban networks in the city so we can visualize, and anticipate the possible consequences of changes in it.

Theoretical framework

Delimitation of the object of study (contextual theoretical framework)

- A. *Product line: Urban networks and virtual reality; sustainability and co-benefits (characterization of the type of supply in production: foliage).*

Urban network and virtual reality

To place ourselves at the base of this research it is necessary to understand the context in which these terms are adopted for the network society and city network. Because the technology does not determine society, but also society dictates the course of changing the technology, however, technology is important because it reflects the ability of societies to transform, it is also seen that technological innovation depends on a mode of interaction complex, and as we referred Castells, in 1970, it constitutes a new technological paradigm around information technology. This new system where a new society is linked to the process of change that is capitalist and informational is born a techno-economic system of informational capitalism that is also arising. It is attributed to this new paradigm of 1974-1979 the increasing in oil prices threatened to put inflation at uncontrolled upward spiral until the 90's, putting a decisive effort on deregulation, dismantling the social contract between capital and labor model based on the stability of growth; so that a new change in the system can include greater

flexibility and adaptation to assimilate the growing changes that are necessary. This technological flowering was bound and rapidly adopted and set in the culture of freedom-oriented, technological innovation and entrepreneurship that resulted from the US fields of the 60's, joined this libertarian spirit, the Internet as we know, also by technological warriors Service Advanced Research Projects arises at this time Department of Defense (DARPA) to avoid making Soviet destruction of American communications in a possible event of nuclear war.

All these changes make the creation of a new technological paradigm that influence globally the society, the economy and the environment as it is constituted.

The characteristics of this new technological paradigm based on the theory proposed by Castells in his book "The rise of the network society Vol. I" which are based on information as a raw material, or are the technologies acting on the information, not just the information acting on the technology. It also refers to the pervasiveness in individuals for adoption to their way of life, they have a logic interconnection entire system or set of relationships and are related on the interaction and it is distinguished by its flexibility, self-expanding, self-generated and the recombining information.

The informationalism spirit that moves this new paradigm consists in diverse subjects and organizations, adapting to the new environments and market structures. It is a multifaceted and virtual culture, the experiences are created in cyberspace and as mentioned by Finkelievich 2010, the construction of cyberspace is strongly linked to the decline of the traditional idea of the city, where the spirit of informationalism as mentioned by Castells (2011: 223-227) is the culture of the relative accelerated destruction to the speed of opt electrical circuits that process their signals and a new type of space called space of flows in which it is possible to modify and rebuild the functions of the city. Where the unit is the network and where the space does not unfold a photocopy of society, where space is also time crystallized and material support are social practices that share the time. The flows are not just elements of social organization but they are also the expression of the process that dominates our economic, political and symbolic life in the so-called network society.

The space of flows is the material organization of social practices in shared time that work through flows, this space of flows shapes the support of the process and functions of the network society formed by an electronic circuit that impulse where the communication network is essential. Therefore, places do not disappear but its logic and meaning are absorbed by the network, connected through nodes and based on the electronic network and where as adding Muxi and Montaner (2014: 80) essentially is no longer tangible, it has ceased to be solid and has fade into thin air. It is now global and it is part of a fluid world, where these dizzying changes of information and communications technology make visible a global world that exists in terms of what the mass media transmit. Thus, there is only what is present in the media.

From this point of view, there is a global world, in which Castells (2011: 444) adds that under this new paradigm, a global city acts more as a process than as a place, therefore, the global city becomes the place where key production activities and informational global economy are generated.

It speaks of a spatial organization of the dominant managing elites, in which the decentralization trends and the multicentrality city meets with the redesign of exclusive spaces and isolated what

Finquelievich called the destruction of public space and the militarization of the city, or what Muxi and Montaner (2014: 104) identified in today's world characterized by the duality between a cosmopolitan class and with many global means, and what may be called servo-proletariat, who works invisibly in the trash work and that comes with a fast, shallow and quality life that is conditioned and do not have a continuity. It is urgent and impersonal, this is where the architecture, history and culture converge. it captures an imaginary world of possibilities unlimited by the media, which passes the passage of "a new city" city-network, this transition to the network society is defined as the city of the new economy, focusing as mentioned in the knowledge and the information that is global and works on networks (Castells, M. Excerpted from Finquelievich, 2010: 620). This combination of factors -offshoring new information- and power systems the new concept of a "global factory" (*fábrica planetaria*) from Muxy and Montaner that allows a product that is designed in New York and in real time, it receives this information in the large eastern factories of China.

Under the conceptualization of Gilles Deleuze and Felix Guattari has emerged a new way of thinking, a rhizome, in which the rhizome has no structure, or binary, or tree or branched, or genealogical: it is a chaotic, underground reality leak, like rats fleeing or ivy growing without plan (Muxí and Montaner, 2014: 83).

It is clear therefore that due to the emergence of new technologies and the increasing demands for being in a competitive, productive, fragmented and dual world, has generated a global dystopia in which a kind of imaginary world is designed, recreating the collage images and the virtual information technology. Which is considered undesirable, although this dystopian place or bad place (from the Greek dys and topos) to be highly flexible, self-generated, self-expanding and with recombining information is presented as an opportunity and a challenge to extrapolate some options to adopt this new way of doing city in a virtual network society, in which an empowerment spread of education, the citizen participation and the care of the natural and built environment is promoted. Expanding the use of new consumerist technologies to achieve a much broader spectrum and generate important markets, this also allows the use of this new technological revolution for sustainable and comprehensive development of urban networks in the city.

Sustainability

It is necessary to understand the different stages about this concept; by the way we use the perspective make by Yory (2004):

The first stage is the beginning of the 70's, where issues of "nature" and "environment" under the figure of "environmental economics" had an important progress and proposals like the one made by Jevons to insert the "equity marginality" the Hotelling with "negative externalities" and the proposal by Georgesu-Roegen in 1971 derived from the second law of thermodynamics.

The second stage marks the emergence of the "environmental revolution", it arose the first conference of the United Nations Conference on Environment and Development that had place in Stockholm 1972 "One Earth"... The Club Report Rome 1972 MIT, where the "environmental issue" became almost a fashion that trivialized the concept. The NGOs, the eco-business, the green parties, and the eco-opportunism arise.

The third climactic stage in the evolution of the Middle Environment-Development relationship, was marked by the creation of the World Commission on the Environment. It occurred in 1987 Brundtland Report "Our Common Future" where it was denominated "sustainable development". Currently, several authors like Gutierrez and Gonzalez (2010), Lopez (2014), Foladori, and Pierri, (2005) among others refer to the inherent problems in adopting the concept of sustainable development by announcing that, what we call development is its currently an unsustainable and self expression global sustainability that can not be achieved by extracting more resources of the planet. As well as sustainability does not have a single expression, and should be seen as a process rather than a predefined target in space and time, so, there is not a unique concept of sustainable development, its validity and possibilities of implementation will depend on the conditions, deadlines and scales of each area.

Similarly, JDS Architects says we have a "cool" problem: the "green" and "sustainable" in which mention that architecture have made more than a desire task. It is cool to consider the sustainability as a proliferation of green pixels worked in Photoshop, but not eloquent, intentional and enthusiastic shots in position on the matter ... His philosophy is that architecture should shift its focus from the idea of "support" to the "habitability"(JDS Architects. 2014:122, extracted from ecological Urbanism).

Yory, talks about how the concept of "Island of sustainability" (*islas de sustentabilidad*) can occupy the possibility of design a Land-Use Planning based not only on what is "fixed" in the city but in its inherent mobility, in this case "islands" act as "lighthouses" that guide the process of development through, and not a single route, but leaves a whole network of possibilities open (Yory, 2004: 100).

On the current concern about these matters, and seeing it tangible in the climate summit (2014) where these subjects were treated to boost economic competitiveness and sustainable prosperity for all, and at the next meeting 2016 Habitat III governance and urban law, urban planning and regulation of housing, infrastructure and basic services, urban economy, sustainability and climate change, cities and post-conflict, equity and inclusion, in which seven themes are established.

It is vital that we can link the technological revolution to sustainable development, so we take advantage of this system to make it a large network of overall performance in pursuit of a multifaceted inter-operability of economic, environmental and social areas. While this integration is not carried out, the hypothesis that arises is to be followed in a real imbalance, away from the virtual reality in cyberspace acts in an intangible dimension, the effects of climate change caused by lack of environmental restrictions, endanger our existence. It is clear therefore that several solutions have been proposed with the Kyoto protocol or the Bruntland report, however due to their lack of application, scope and operation, as well as heedlessness governments and people often see that the goals takes a long time (in this society of immediacy and changes in one click), it is necessary a method to help and facilitate in a shortest time, to achieve this necessary goals. Emerging strategies help to maximize the effects of the inter-operability of this system to be deployed self-expanding and multiple benefits between society, environment and economy to be achieved and enjoyed in a short time, but with impact equally in the medium and long time, due to a new term emerged, and it is able to propose strategies

for the immediate network society, self-expanding, self-generated and with high scalability and survivability in a comprehensive and joint way as a win-win strategy for everyone, that is the co-benefits approach.

Co-benefits

The terms of the collateral benefits appeared in the academic literature in the 1990s and generate a great interest in the time of the Third Assessment Report (AR3) and in 2002 it was published by the Intergovernmental Panel on Climate Change (IPCC).

The concept of co-benefits that addresses US EPA, Manila Observatory and CAI-Asia in a study called "the co-benefits of climate change response: Situation in Asia." (Castillo, et al 2007: 6-7) and show us some of the most important definitions about this:

- *"The concept of a "co-benefits strategy" or a "co-control measure" states that it is a single activity or policy can generate multiple benefits across varying sectors or fields of study"*
- *"The Intergovernmental Panel of Climate Change (IPCC) Third Assessment Report on Mitigation, differentiates "co-benefits" as benefits intended as the primary objective of certain actions or policies from those that are not".*

Co-benefits are essential to the progress of work, integrating climate change linked to other issues such as air quality, energy, transport, and sustainable development in general (Castillo, et. Al, 2007).

In recent years, the terminology has been used-benefits in three ways:

- "Development of co-benefits" it refers to the legal benefits of climate change policies such as improved air quality clean technology to have better jobs.
- "Climate co-benefits" it refers to the global climate change benefits of development plans. This point of view emerged in response to the belief that countries will focus on climate before development (Schipper, 2008).
- "The climate and air" concerning the multi-directional impacts of intervention usually air pollution. It is employed on the community air pollution, and climate heaters such as carbon black ... (Bond, 2008).

Meanwhile Allison Smith 2013 presents another definition in his book "The Climate bonus: the co-benefits of climate policy" in which she explains that:

- *"The co-benefits are the additional benefits we get when we act to control climate change, above and beyond the direct benefits of a more stable climate. They are sometimes referred as "multiple benefits" of "synergies". They don't include direct benefits of climate policy derived from a more stable climate. "*

In conclusion we will refer to the concept of co-benefits defined as an intentional decision regarding a hybrid concept aimed at specific targets in different areas with strategies co-control that reduce global warming, pollution, vital conservation for energy resources, food and also considers other specific benefits of great importance as the improvement of urban planning, cost reduction and return periods of capital and maintenance, reducing health impacts, and improving the economy.

Under the implementation of public policies, focused on a "win-win" approach between nature, people and industries which would mean an additional impact for the benefit of all intervention measures in different time scales.

Dividing them into six categories I. Clean Air; II. Greener earth; III. Secure energy; IV. Less waste; V. Stronger economy; VI. Health & Wellness (based on Smith. 2013).

In the view of technological development through new information technologies, that are integrated by networks, multi-node and multi-faceted, in which flexibility, scalability and survivability of dynamic and convergent models allowed to interact in the network society. Thanks to its inter-operability have become an important part of social development in a global scale, as well as the economic development of cities, creating in them macro centers, materialized with the network company and convergence with all the problems of today's world. The duality of Cosmopolitan segments and garbage life (*vida basura*) brand as well as the emergence of major economic powers while major environmental disasters, put at stake the reality of this new global system and homogenizer and its new immaterial networks in the urban context and under the precept of sustainability, a new line of analysis of intangible sustainable urban city networks become as fantasy and reality and as a dystopia in the city who is achieved. Where is not only important to believe presented in the collage of characteristic images of this virtual reality, as well as new nodes expressed in cyberspace of the space of flows. If the consequences of this system as it is not plausible, being ephemeral and timeless, have linked us to circumstances where we want to be outside or just engaged with an image, but however the impact of this system beyond the intangible are linked to tangible impact of a cataclysmic anthropogenic system that we have developed on the planet we inhabit.

For all that, to link the advantages of this new technological paradigm, we have the opportunity to create equally viable, self-programmable, self-generated and self-expanding strategies with flexibility, scalability and survivability inter-operation in a short-term; so we could achieve a network society in the current global immaterial convergence with the material capability to be mutated into a new integral dimension involving economic, social and environmental impact of this dystopian, dual, sustainable and smart world.

B. Production capacity: conditions involved in the production of the co-benefits and intangible sustainable urban networks

Informational City and global networks

The revolution in information technology has been useful to carry out a fundamental restructuring of the capitalist system of the eighties, to be layers to become an advanced system of capitalism that, in the alternative line of this type of social organization emerged in our historical period, the so-called statism in which he tried to redefine the means of accomplishing its structural goals while preserving its essence.

The meaning of restructuring (*perestroika* in Russian) failed because of their inability to assimilate and use all systems and embody the principles of informationalism in the new information era (Castells, M. 2011: 39), carried out by some countries such as China and Russia.

In the information age mentioned Castells (2011) is remarkable the beginning of a new urban form based on the informational city, due to the nature of the new society based on knowledge, organized around units and networks and composed in part by flows, the informational city is not a form but it is a process characterized by the structural domain of the space of flows, a geometry of nowhere and development of exurban constellations with a functional vague interplay of different units and process in a given urban system over distances, maximizing large communication networks.

Rainer Randolph (2000) points to another kind of disappearance of the city, the urban object. It perceives cities, not as an actor, not as nodes of regional, national or global networks, but as network cities. Transformations and urban representations reflect a new quality of movement of goods and merchandise, services (information) and people both in the city and among the cities, where the movement becomes increasingly "virtual" (informational or immaterial) and necessary urban telemetric equipment, contemporary metropolises assume the character of network; They are oriented toward the essence of network city, weakening the urban reality material (extracted from Finquelievich, 2010: 621).

Globalization and Global City

The informational and global economy is organized around command and control centers. As the global economy expands and incorporates a new market, it also organizes the production of advanced services that are required to manage the new units that join the system and the conditions of their connections, always changing. The phenomenon of the global city can not be reduced to a few urban centers of the upper level of the hierarchy. A process involves advanced services, production centers and the markets of a global network, with a different intensity and a different scale. Globalization stimulates regionalization, evolutionary architecture of information flows in the global economy. (Castells, M. 2011: 411- 414).

This is how the architecture and geometry of the informational and global economy arises, in which the structure of this economy is characterized by the combination of a durable Architecture and a variable geometry; The architecture of the global economy provides an asymmetrically interdependent world, organized around three major economic regions. Among the three key regions, Europe, North America and Asia Pacific; Inside there is a visible architecture competition and dynamic processes of change that make the global system of economic processes in a variable geometry. The differential location of these types of work also determines the prosperity of the markets as an income generation depends on the ability to create in each segment of the global economy value (Castells, M. 2011: 173-175).

If we accept the concept of globalization as one that characterizes the contemporary condition, the term "global city" (trends from the last quarter of the twentieth century) can be used. It crises of an urban model marked by functionalization of the whole territory, diffusion and dispersion of urban areas that make up a mosaic of fragments. Unrelated the elements of the global city that are present are the highways; the drastic systems of access control, skyscrapers and shopping (Montaner and Muxí. 2013, p. 115-121).

In 2011, substantial changes are evident in three types of phenomena that characterize the cities, territories and states at the beginning of the century. First, with respect to capital, has

completely transformed a scenario that tends to dialyzed, between global metropolis that leverage capital flows and capital is actually delocalized... the business structures are no longer visible... second modern societies are hybrid and are formed by a mosaic of subcultures. The third variable are the technologies that enhance communication in a fragmented landscape, immigration live in real space both source and destination (Montaner and Muxí. 2013: 79-81).

We conclude with the foresight shown by Branzi in which some recommendations are made for the formulation of a new Charter of Athens (Branzi 2014: 110, extracted from ecological urbanism...): 1st Urban refunctionalization; The 2nd major transformations by microstructures; 3rd The city as a high-tech favela; The 4th City as a personal computer each 20m²; Models of the 6th & 7th urbanization weak blurring boundaries and foundations.

Metropolises and cities

According to the UN report (2000) from 2000, just over 50% of the world population lives in cities, to be affected, particularly the cities of the "Third World", since it estimates that of the 20 megacities (cities with more than 8 million habitants population 14 are located in Latin-American countries (Yory. 2004:21-24).

Megacities are larger agglomerations of human beings with more than 10 million inhabitants. in 1992. In that size is not what defines if the nodes of the global economy. Megacities can not be considered only in terms of size, but also in terms of its gravitational power toward major regions of the world, they articulate the global economy, connect the informational networks and concentrate global power. But they are also the depositories of all segments of the population that is struggling to survive.

They concentrate the best and the worst. The most significant about the megacities is connected on the outside with global networks and segments of their own countries, while they are disconnected within local populations that are functionally unnecessary. This distinctive feature to be globally connected and locally disconnected, physically and socially, which makes megacities a new urban form. They are discontinuous constellations of spatial fragments, functional parts and social segments (Castells, M. 2011: 436-443). This global network of cities creates a new global economic geography, which crosses national borders and traditional north-south division of the industrial economy.

According to Zygmunt Bauman, it refers to the "Liquid Life" which is based on the speed of change, precarious work and the continuous increase in the areas of exclusion (Montaner and Muxí. 2013: societies. 104-105).

A sample of how a city should be made are the called "alternative cities" an example of those cities are Curitiba, Seattle, Bogota, and Medellin, each of them shows well-managed cities with a critical and active citizenship that can be the key to improve the world (Montaner and Muxí. 2013: 128-142).

In another proposal made by Branzi, 2014, it sets up the concept of "the weak Metropolis" to be applied in the metropolitan, stating that models with a weak development are based on the cohabitation of semi-rural and semi-urban areas. The weak metropolis it is not a system of architectural boxes, but an enzymatic territory of permanent change, consisting on a personal

computer each 20m², is not the metropolis of the future but the present in which the quality of it lies in the quality of its objects (Branzi. 2014: 112 extracted from ecological urbanism).

Another reference is introduced in the ecological urbanism which proposes to multiply the lines of thought on the contemporary city to include environmental and ecological concepts... it promises to adapt the specific conditions of the ecological, economic and social circumstances of the contemporary city... In which involves generating alternative futures... Bhabha adds "it's always too early or too late to talk about future cities" (Waldheim. 2014: 114 extracted from ecological urbanism).

Thus, as proposed for Finquelievich, Cities in the Information Age should be producing innovation and wealthy means, capable of integrating the technology, society and quality of life in an interactive system that produces a virtuous circle improvement, not only of the economy and technology, but of a society, culture and environment (Finquelievich, 2010: 617).

C. Powers (roots) available technology, human resources and organizational design for the production of intangible sustainable urban networks in the dystopian city

In 1970, a new technological paradigm is organized around the information technology (Especially in the US) linked with the emergence of the Internet in which the result was a network architecture, which could not be controlled from any center, consisting of thousands of autonomous computer units and networks that have innumerable ways to connect, upgrading the electronic barriers.

ARPANET, the network established by the US Department of Defense eventually became the basis of a network of global and horizontal communication networks with thousands of exponential growths.

The ability or inability of societies to master technology, particularly those that are strategically decisive in each historical period, defined largely destination, technology embodies the capacity of societies to transform, Mokyr also considers that the State is key on explaining the technological backwardness factor. An understanding of the relationship between technology and society is that the role of the State, either stopping, sparking or managing technological innovation is a decisive factor in the overall process, as it expresses and organizes the social and cultural forces that dominate in a given space and time. From 1974-1979 increases in oil prices threatened to put inflation at uncontrolled upward spiral until the 90s, putting decisive effort to deregulation, dismantling the social contract between capital and labor, model based on the stability and growth, which contributes to the emergence of a new economy worldwide: informational and global. Because the productivity and competitiveness of units or agents in this economy fundamentally depends on its ability to self-generate, self-programmable, and recombining information knowledge effectively in the global network. The production, consumption and circulation are organized on a global scale, either directly or through a network of links between economic agents.

Thus, the mention of Castell (2011) the productivity enigma dispels through the output and input over time. Profitability and competitiveness are the real determinants of technological innovation and productivity growth. So within the architecture and geometry of the informational and global economy it is visible in dynamic processes of competition and change that make the global

system of economic processes in a variable geometry resulting from these processes of innovation and competition interacts with architecture, produced by history an economic order in the world, inducing the creative chaos that characterizes this new economy.

With this new movement it is able to move from mass production to flexible production, on the formulation of Piore and Sabel where "production accommodates to change without trying to control it," a model of industrial craft or customized production. Within this framework arises the business flexibility for small and medium-scale based on multidirectional networks that are materialized in franchises and the subcontracting under the cover of a huge company, which generates interconnection strategies to emerge. Thus the great company changes its organizational vertical business model to suit the essential conditions that indicate the fast, economic and technological change.

Flexible production maximizes the response of economic agents to enroll a quickly change in their units. It also increases the difficulty of controlling and correcting articulation errors, but it is flexible and self-programmable, this means that it has the ability to restructure, recombining information and reintegrating it with the logic of the enterprise system, with units interconnected in real time, (Castells, M. 2011: 196) that factor allows the emergence of the network enterprise of the informational and global economy.

The spirit of informationalism is the result of diverse backgrounds, the first of them is the culture of the mass media with the emergence of mass society in which "the medium is the message", then the culture of new media communication and the diversification of the masses in which "the message is the medium", later with the great multimedia broadcast as a symbolic environment in which "the message is the message" and finally a centralized multimedia issuance system in which "make believe and do it" culture of the ephemeral, where time is compressed and ultimately refuses, as a primitive replica of the production turnover.

While at the same time context, climate change becomes a key point on the design, planning and configuration of objectives and policies due to major pollutants produced by the economic system that was inherited from the industrial system, it is still a challenge in the information's revolution.

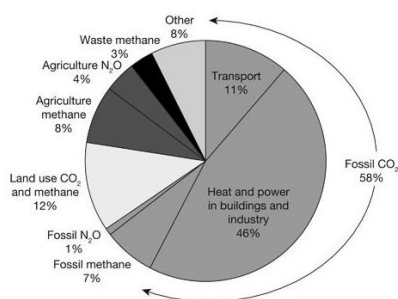


Figure 2.1 Global greenhouse gas emissions, 2008

Source: Smith, A. 2013.

Conclusions chapter

The current literature explains a new process in which we are bound as a network society of quick change, in the same way the literature goes to the proposal and conceptualization of new

places that produce this new technological revolution, through the space of flows in the cyberspace with virtual nodes, units and networks. In a convergent line we found the sustainable development in which the literature talks about building measures to reduce the impacts of the economic and social industrial and technological macro-development, based on a new category of analysis called co-benefits that offers the promise that we can be able to anticipate to the climate change in the era of the global systems.

Hypothesis, what we are expecting to find?

With new converging lines between technological paradigm and sustainability development in relationship with the co-benefits we could anticipate possible changes in a flexible, adaptable, inter-operable and smart path, considering the co-impacts that are implied in the intentional decisions that test our livelihood in the planet where we live.

Methodology

The prospective methods can be classified in a continuum from quantitative to qualitative and vice versa. Taking as a quantitative a time series analysis used for the problem tree chart of Marc Giget. Moreover, the qualitative end, future will be primarily the result of the analysis and interpretation made by the experts.

Methodology development

The research is carried out in several steps, starting with a review of the literature regarding to the sector of urban networks and virtual reality, sustainability, co-benefits, climate change, and metropolis to establish the theoretical background of this investigation.

In this research, we used the competency tree chart proposed by Marc Giget that seeks to systematically represent the object of study to obtain a diagnosis of their past, present and future. In these case, focused on the available technologies, broadcasts, programs, and systems used for the production of intangible sustainable urban networks in the dystopian city. In the core production capacities are reflected: the conditions involved in producing the co-benefits for urban networks and virtual reality, in which the variables are stipulated as to the informational city and global networks, globalization and metropolis; while in the product branches they were located in this case properly to urban networks and virtual reality, sustainability and co-benefits. With the mapping of the past it was allowed to place the organization in a historical reality understanding the aspects that remain constant, and its ability to evolve, while the mapping of future risks and opportunities that allow us to take on challenges in the construction of the desired future.

Time intervals:

The last time interval spanning from 1987 to 2009; this is between 2009 and 2012, and the short-term future goes from 2013 to 2016. The time periods are posed by the composition of key moments in the development of cities and sustainability agreements and the emergence of the new paradigm technology from the 80s.

Structuring the tree diagram: A. Product Line

A. Product Line (foliage): characterization of the type of supply of the organization

- Urban networks and virtual reality
- Sustainability
- Co-benefits

B. Production capacity (trunk): conditions involved in the production of sustainable housing through the co-benefits.

- Informational City and global networks
- Globalization and Global city
- Metropolis city

C. Powers (roots) available technology, human resources and organizational design for the production of intangible sustainable networks in the dystopian city

- Materials, systems, networks and technologies
- Programs (supply and service quality).

Swot

SWOT analysis is a tool to complete the diagnosis, since it allows analyzing the internal influences, represented by the strengths and weaknesses, and external influences, formed by the opportunities and threats presented in the sustainable immaterial urban networks through the co-benefits.

A SWOT analysis was performed for each of the representative areas of the competency tree chart from the information that is identified in the theoretical proposals of the experts.

Modeling scenarios

Less active role in society	More government support		More active role in society
	2 Their times	3 Great times	
	1 simple times	4 our times	
	Less government support		

Source: own creation based on Gándara y Osorio, 2014.

- Scenario 1 *Simple times*: represents the worst situation that can happen: none of the actors involved appreciates technology and sustainability. The government does not carry out actions to support the impacts and the technological gap. In addition, that society still does not become aware of the collateral benefits of technology and sustainability so they decide not to adopt it.
- Scenario 2 *Their times*: represents a context where despite the government efforts to encourage the use of technological means and sustainable strategies the society still rejecting them.

- Scenario 3 *great times*: represents the ideal situation under they could achieve the technological gap and the sustainability process, increasing the collateral benefits with the environment, society and economy integration.
- Scenario 4 *our times*: even though the society is aware of the great advantages that have the sustainability projects and the information technology, it is not a government priority.

Results, conclusions and discoveries

It is necessary to use new methods to achieve sustainability objectives and projects.

The adoption of information technology and communication could be a key point on the development of this new immaterial system, in a way that could specify the real results in a short time and at the same time hold implications for the future. This system is highly flexible, self-expanding, self-generated, adaptable and self-programmable, with scalability and in a inter-operability process integration with the environment, economy and society.

The State has an important role in getting the network society to adopt new strategies around information revolution and new alternatives to create a environment-friendly city; implementing programs and politics for the population, companies and developers, and adding new and better practices in the lifestyle, and getting agreements with companies to generate low environmental impact products, could generate more desirable scenarios in the short and long time.

Modeling these possible scenarios of co-benefits in the urban network of the dystopian city, we could be able to clarify their times, the great time, the simple times and our times, and where we can reach the outlined strategies to penetrate in the society, having a gap between an environmental and a technologic process in the global network.

References

- Yory**, Carlos. *Ciudad y Sustentabilidad: I. Marco General y descripción de la problemática*, Universidad Piloto de Colombia, Bogotá, 2004.
- Foladori**, Guillermo y Pierri, Naína. *¿sustentabilidad? Desacuerdo sobre el desarrollo sustentable*. Universidad Autónoma de Zacatecas y Porrúa, México. 2005.
- Myers**, William. *Bio design*. Thames & Hudson, Londres, 2012.
- De Garrido**, Luis. *Arquitectura para la felicidad*, monsa, Barcelona, 2013.
- Montaner**, Josep y Muxi, Zaida. *Arquitectura y política*, Gustavo Gili, Barcelona, 2013.
- García**, Dulce. *Análisis y propuesta de sistema de evaluación nacional para las edificaciones*, UAG, Guadalajara, Jal. 2013.
- Gutiérrez**, Esthela. y González, E. *de teorías del desarrollo al desarrollo sustentable*". UANL y Siglo XXI, México. 2010.
- Miyatsuka** y Zusman. *What are co-benefits?*. Asian co-benefits partnership 1. 2010. <http://pub.iges.or.jp/modules/envirolib/upload/3378/attach/acp_factsheet_1_what_co-benefits.pdf> 27 de mayo 2015

- UN-HABITAT.** "Co-benefits of Green buildings and the opportunities and barriers regarding their promotion", en *UNU-IAS*, Número 171, 2011, [En línea] <http://archive.ias.unu.edu/resource_centre/Working-Paper-171_Osman_Balaban.pdf> 2015.
- Foster, Norman. *Architecture and Sustainability*, 2013. [En línea] <www.fosterandpartners.com/datapractice-data/essays/essay13> [2013, agosto 24]
- Balaban, Osman.** Editado por Osman Balaban. *UNU-IAS*, No. 171. 2013.
- López, Víctor.** *Sustentabilidad y desarrollo sustentable: origen, precisiones conceptuales y metodología operativa*, Trillas México, 2014.
- ENTE S. C.** *Co-beneficios de un programa de vivienda energéticamente eficiente en México*, CONAVI, México, 2013.
- Stern Review, Foreign & Commonwealth,** Stern review on the economics of climate change & HM TREASURY, Reino Unido. 2007. <<http://www.catedracambioclimatico.uji.es/docs/informestern.pdf>> 12 octubre 2015
- Economist Intelligence Unit.** "Índice de las ciudades verdes en América Latina". Siemens AG, Múnich, 2010.
- Prasad et al.** Editado por Osman Balaban. *UNU-IAS*, Número. 171. Yokohama. 2009.
- Inventario Nacional de Emisiones GEI. "Contribución de emisiones de GEI por sector". Mexico **Fourth National Communication**, México. 2006. <<http://www2.inecc.gob.mx/publicaciones/libros/615/inventario.pdf>> 26 de mayo 2015
- Castillo, et al.** "The co-benefits of responding to climate change: Status in Asia". US EPA, **Manila Observatory and CAI-Asia** 6-7. 2007. <https://www.google.com.mx/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CB0QFjAA&url=http%3A%2F%2Fcleanairasia.org%2Fportal%2Fsystem%2Ffiles%2Fdocuments%2FCo-benefits_of_responding_in_Asia_-_Status_in_Asia_2007.pdf&ei=vhdmVc3jBonGsAWQ84DQAq&usq=AFQjCNEEL4OWZR7ut0K0qCSNKldosKGLiQ&sig2=KXEj5KBzdnalbGZtH4rsXQ&bvm=bv.93990622,d.b2w> 27 mayo 2015
- IPCC.** "Co-benefits of industrial GHG mitigation." <https://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch7s7-10.html> 27 mayo 2015
- Bollen, et al. *Co-benefits of climate change mitigation policies: literature review and new results*. Organization for Economic Co-operation and Development. 2009.
- CONAVI y SEDATU.** "Programas de vivienda sustentable". 2012. <<http://www.conavi.gob.mx/viviendasustentable>> 28 mayo 2015
- Smith, Alison.** *The climate bonus: co-benefits of climate policy*. Routledge y earthscan from routledge. Kindle edition, London y Nueva York. 2013.
- Fundación CIDOC.** *Estado actual de la vivienda en México 2014*, CIDOC y SHF, México, 2014.
- Montaner, Josep.** *Del diagrama a las experiencias, hacia una arquitectura de la acción*, Gustavo Gili, Barcelona, 2014.
- Doherty, Gareth.** *Urbanismo ecológico*, Gustavo Gili, Barcelona, 2014.
- Gándara, Guillermo y Osorio Francisco.** *Métodos prospectivos Manual para estudio y la construcción del futuro*, Paidós, México, D. F. 2014.

Iracheta, Alfonso. “*La dimensión humana en las ciudades y metrópolis*”. Red mexicana de ciudades hacia la sustentabilidad y colegio mexiquense, Mexico, 2010.

Castells, Manuel. “la sociedad red: una visión global”. Alianza editorial: Madrid, 2004.

Castells, Manuel. “La era de la información: economía sociedad y cultura, vol I.” Siglo veintiuno editores, Mexico. 2011.