Working Paper Nº 6

**WHAT IF DEVELOPMENT
IS REALLY THE EMERGENCE OF A SYSTEM?**

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> *"Perhaps your worst enemy is orthodoxy...*
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> *...it is true: the main enemy is really orthodoxy; to repeat forever the same recipe, the same therapy, to cure different types of illness; to refuse to recognize complexity, to try to reduce everything at any cost; while real things are always a little more complicated."* [editor's translation]
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General summary

Abstract

The author puts forward a daring hypothesis that could have enormous impact on both theoretical thinking about and the practice of territorial development. The author argues that territorial development should be understood as an emergent property, in the sense of the systemic emergence of a complex territorial system with enormous synergy. This proposal is completely opposite to current policy and planning practices to encourage development at a sub-national scale, implicitly based on the type of "disjointed incrementalism" identified by Lindblom. If the hypothesis passes the usual methodological filters, it will be necessary to radically retrain those responsible for these processes, teaching them system theory, along with neuronal synapses, synergy, diffuse logic, temporal irreversibility, chaos, etc, and everything else that appears behind emergent properties, and it will also be necessary to radically reformulate bureaucratic structure and functioning of political and technical bodies acting in the field. Development must be rewritten in the framework of a complexity paradigm and one such as that used by this author that is both humanist and constructivist. Key words: systems, emergent properties, synapses, synergy, territorial development, complexity.

Introduction

Recent years have seen the healthy evolution of the concept of development, which has steadily distanced itself from the interpretation, rooted in the 1940s, which identified it with the most elementary concept of growth. More and more often one reads interpretations of development that locate it in a much broader context that that of the economy, bringing it closer to a kind of constructivism in which the subjective, the value-related, the intangible, the holistic, the systemic, the recursive, the cultural, the complex, and other characteristics prevail, to list just some of the characteristics attributed today to social development. This process also involves a noteworthy return to the thinking of several economists, of the not-too-distant past, including several still active. Among others, I am referring to the French priest, L-J. Lebret, F. Perroux, G. Myrdal, A. Hirschmann, D. Seers, A. Sen, and, among the Latin Americans, C. Furtado.

A recovered sense of the spiritual and humanism seem to be developing and empirical systemic studies carried out worldwide by the United Nations Development Program (UNDP) have managed to socialize a benchmark known as the "Human Development Index", which, despite its limitations, already expresses part of this recovery in its very name, without managing to escape a certain tautology, because if development is not human, what would the entelechy be?

Without trying to offer an absolute definition and merely to illustrate the above observations, a recent study (Boisier, 2001/a: 30) notes the following [translated from the Spanish]: "*...today development is understood as the achievement of a context, a medium, a momentum, a situation, an environment, or whatever it is called, that facilitates the realization of human potential to turn oneself into a human person, in the dual dimension of biological and spiritual natures, able, in this last sense, to know and to love. This means relocating the concept of development in a constructivist framework that is both subjective and inter-subjective, value-related or axiological, and of course, endogenous, that is, directly dependent on collective self-confidence about the ability to 'invent' resources, mobilize existing resources and to act cooperatively and in solidarity, from one's own territory…*"

Luciano Tomassini (2000:63) refers to the "cultural turnaround" in our period with regard to development in the following words [translated from the Spanish]: "*We are living through a "change of epoch" that essentially rejects the rational, uniform, closed models that mature modernity proposed, in favor of diversity, the ability to choose and to create our identity in more complex societies, made possible by advances in knowledge, technology, information, freedom, consumption and communications, and profound changes in individuals' subjectivity. In this cultural scenario, economies focus on producing meaning and societies, education and consumption move in virtual worlds, peopled by potential and multiple alternatives. In this context, the importance of government, electoral majorities and macroeconomic balances, of gross domestic product, and average monetary income in societies at the very least becomes relative to emerging concerns about the quality of life, participation in society, the possibility of choosing one's own life style, freedom of expression, respect for rights, education, equal opportunities, equivalence in dignity, the role of young people and women, citizens' safety and life in cities that, for lack of prior concepts, were considered "values issues".*"

Exactly 20 years ago, Celso Furtado (1982:149) spoke without being heard about development as follows [translated from the Spanish]: "*...Experience, however, has clearly*

demonstrated that true development is mainly a process of activating and channeling social forces, of progress in associative ability, in exercising initiative and invention. As a result, this is a social and cultural process, and only secondarily economic. Development occurs when society reveals an energy, an ability to channel in a converging fashion forces that are latent or dispersed."[1]

Amartya Sen himself (2000:114) defines underdevelopment as [translated from the Spanish] "... *the privation of basic capacities and not merely the lack of income, which is the habitual criteria used to identify poverty,"* thus swimming against the current in his view of the non-material nature of development.

In a lecture given by Joseph Stiglitz in Havana this year,[2] he said [translated from the Spanish]: *"In one country that I visited, instead of proposing to raise Gross Domestic Product, the authorities identified the national mission as maximizing Gross Domestic Happiness. This was a small country and I don't know of any large country that has explicitly set itself this kind of objective."* Si non e vero....

Undoubtedly, a virtually endless series of current definitions could be added that seek to resituate development more in the field of *to be* than in the field of *to have.* Development should never have ceased to be the social utopia par excellence, Milton's version of humanity's lost paradise.

The weight of the cartesian night

This progressive, multidimensional enrichment of the concept of development must of course be positively valued. We now know that development and growth are structurally different concepts, intangible in the case of the former, material the latter, with all that this implies. We do not yet know, however, the nature of the relationship between both, because clearly they are interdependent. By way of a hypothesis we can suggest that this relationship is neither linear nor hierarchical, a stance that requires leaving behind any belief in the "trickle down" theory, so dear to the right's neo-liberal thinking. Another hypothesis is that both processes are linked in a mathematically complex fashion, perhaps via a loop (Francisco Varela, the distinguished Chilean biologist, recently deceased, used to say [translated from the Spanish]: *"Forget about the idea of a black box with entries and exits. Think in terms of a buckle."*). One could even go one step further, as I would like to do with empirical proof, and suggest the relationship takes the form of a double helix, like DNA, which would suggest that through time, the order of appearance of both processes could alternate. Perhaps for some cycles of time, growth must come first, to provide a material basis for development to begin, while in other cycles, first the psychosocial conditions essential to development must be generated and these then stimulate economic processes based on risk, ability to associate, innovation and investment. At least it sounds attractive!

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[1] Compare this with the similar, perhaps stronger, position of this author, in relation to the concept of "cognitive synergy", as the basis for social and political consensus, Boisier (2000).

[2] Asimetrías e hipocresía (*Asymmetries and Hypocrisy*), lecture by Joseph Stiglitz, Nobel Prize in Economics, at the Fourth International Meeting of Economists on Globalization and Development Problems, Havana, 11 February 2002.

Despite all the positive aspects of the tendencies remarked above, personally I still have the impression that we remain victims of the "sum syndrome", that is an analytical vision of things that pushes us to give priority to addition rather than multiplication, a metaphorical way of indicating our limited ability to think systemically or our tendency to feel more comfortable with entropy (a disorder that tends to be fatal) rather than synergy.[3] As Nieto de Alba states [translated from the Spanish]: "*We have reached the point of considering that simple, predictable, linear phenomena prevail in nature because we are inclined to choose them for our studies, because they are easier to understand...*" (1998: 97).

Although many government functionaries have never heard such complicated terms as "disjointed incrementalism" or the untranslatable <u>muddling through</u>, both linked to Lindblom (1969), the practice of public planning and formulating public policies and programs (with or without a framework such as a plan) today most closely follows an iterative form of action, a sequential attack on specific problems, a sort of piecemeal strategy. As mentioned above, behind this is something worthy of Popper, in the sense of it being easier to reach consensuses about "evil" problems, rather than idealistic proposals. For now, I would just like to note that, as we will see below, true development cannot be achieved merely by the "sum" of actions, without concern about the intrinsic merit of each.

It occurs to me that foci such as those described are ultimately explained by the scientific paradigm in which every one, without exception, here and there, has been trained. Here I am referring to the positivist paradigm constructed half a millennium ago and based on fundamental contributions from Newton, Bacon, Descartes, and later, de Comte, who is generally considered the founder of positivism, although the paradigm was built up over two centuries. The linearity, the proportionality, the certainty, the empiricism, and above all the Cartesian disjunction, which forms the basis of the analytical method, prevent us from comprehending social reality in all its complexity. Development, it must be stated, is undoubtedly a highly complex question or problem, whose understanding requires mental models based on other paradigms, specifically the constructivist paradigm, as proposed by this author (Boisier, 1998), among others, on the basis of a non-linear, holistic, probabilistic, subjective and intuitive, etc., approach, and the paradigm of complexity, which is recursive, dialogue-based, and hologramic, as Edgar Morin used to say. Clearly, the thing is that people do not change their way of thinking from one day to the next and to create people used to thinking about complexity requires nothing less than profound reforms to the educational system. The now "dissident" Stiglitz, cited above, says this too, undoubtedly with more authority (2000:101) [translated from the Spanish]: "*...development requires a change in mental predisposition and, in particular, an acceptance (…) of change.*" In his book, <u>All That is Solid Melts Into Air: The Experience of Modernity</u>, Marshall Berman made it clear that being modern is precisely "to be" with change and to accept it, and because of this, development is modernity itself, at any moment in history.

The understandable immediacy with which governments operate also affects the achievement of development, and this is all the stronger where the material deficit is greater. No one can oppose the urgent need to provide water, energy, transportation, or to build homes, schools, hospitals and courthouses for example. But to confuse all this with development is a mistake.

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[3] I know very well that the Spanish Royal Academy does not accent the word *sinergía*. I will do likewise when I hear them speak of <u>entropia</u>, with no accent.

Somewhere else I stated that building new courthouses may seem like an obvious necessity, but does it guarantee people will get more justice? Thus, it appears that there is a tendency to confuse means and ends. Development has to do with the ends and is entwined with the means through efficiency and ethics, but it should not be confused with these. Development is teleological, that is concerned with issues of principles; growth is instrumental.

No less important, as a barrier to development, is the "electoralism" so common in conditions of competitive democracy. The need to keep voters' support exaggerates governments' inaugurations of visible works to manic proportions. It is true that a bridge can be seen and used immediately, whereas the movement of a society away from mistrust and toward trust, which is much more important, is not apparent at first glance and its socialization takes a long time. Nonetheless, instead of throwing democracy out the window and opting for an authoritarianism that provides a stable (?) long-term horizon, it is better to build a consensus-based national political blueprint, that is State- rather than government-based.

The economists, who early on took over the concept of development, are mentally trained from their first day at the faculty to understand what is understood as the "economic problem": multiple ends that can be ordered in a hierarchical fashion, scarce and polyvalent resources, we were told. It is easy to understand that a given quantity of financial resources may be used either to build housing or to buy weapons, Samuelson's classic dilemma between canons and butter. What is not as obvious, at least now, several decades after receiving this indoctrination, is that justice, for example, may be more important than freedom, or that social capital is more important than civic capital, the opposite of what happens with the duly contextualized comparative importance of housing or weaponry. With this type of training, an economist in a high public position will tend to prioritize concepts that are difficult to rank, that are not nouns, but rather adjectives, because they are values, and as a result personal subjectivities not possible to be externally handled, or they will rank sectors, especially social sectors, whose growth is conceived of as a single process. It will then be said that health care comes before education, for example, without, needless to say, sparing the polite phrases in favor of education. Now, we know that this pair of collective services <u>must</u> constitute an inseparable whole (it is well known that mothers' lack of schooling is decisive in their children's health and mental capacity). Even more complicated are attempts to prioritize strictly value-based concepts. As Risieri Frondizi (1945:15) says [translated from the Spanish]: "*Values, therefore, are not things, or experiences or essences: they are values.*"

The positivist paradigm and the analytical method raise two barriers to thinking, in general, and reflection, in particular, about development: they inhibit our grasp of complexity, a growing characteristic of social processes, and restrict a systemic vision of them. We are victims of a sort of *Cartesian malady* that pushes us into reductionism and whose most significant consequence is, in my opinion, the inability to formulate theoretical and cognitive frameworks able to explain the structure and dynamic of processes requiring social intervention (not necessarily or exclusively of a governmental nature), frameworks that should, if they really existed, guarantee the efficiency of interventions. Because they do not exist, because we continue to believe that development is achieved by "adding together" projects, the objective has become elusive, as Marshall Wolfe, the often remembered Australian sociologist from ECLAC, used to say, unreachable or reachable through "good luck" or extremely lengthy processes of systemic self-organization, incompatible with the timeframe of social demands. While simple phenomena can be analyzed by part (because in these cases the whole is equal to the sum of the parts) and something can be understood about the system without

understanding the whole, in chaotic (highly complex and sensitive) systems non-local predominates: knowledge of the whole is required to understand the parts (because in these cases the whole is greater than the sum of the parts).

But do not think that the briefcase of theoretical approaches to growth and (territorial) development[4] is empty. To the contrary, it is almost full and it is only where its contents belong that is questionable.

Recently, I have had the chance to read two magnificent syntheses of theories of growth and territorial development. H. W. Armstrong (2002:232-242) briefly examines the set "*a la mode*" in this area and states: "*There are no fewer than seven separate theories of regional growth 'in play'*". He goes on to describe them: the neoclassic conditional convergence theory, the endogenous growth theory, radical and "post-Fordism" theories, the theory of social capital, models of the new geographic economy, export competitiveness models, and "innovative milieux" and learning regions. If any criticism could be made of Armstrong's list, which would be applicable to most English-language writers, it would be due to the excessive amount of references to literature only in that language.

At the same time and on this side of the Atlantic, the Colombian economist, E. Moncayo (2002) recently on behalf of ILPES (the Latin American and Caribbean Economic and Social Planning Institute, a UN body), prepared a complete study, which also notes as support for regional policies practiced in Latin America, theoretical categories, such as the Keynesian or neo-classical approaches, endogenous growth and others based on flexible accumulation.

I am sure that most of the specialists in this area feel dissatisfied with all these instruments, most of which deal more with economic growth rather than development. This collective body of literature that forms the analytical and positivist inheritance has not managed to escape from the "weight of the Cartesian night".

The changing concept of development: trying to correct mistakes[5]

The Atlantic Charter, a political agreement to reorganize the post-war world, signed by Roosevelt and Churchill in 1941, seems to represent the birth of an idea of development in the field of national and international public policies.

This document indicates that the only certain foundation for peace lies in a situation where all free people of the world can enjoy economic and social security, and therefore commit themselves to seeking a world order that will ensure these objectives are met, once the war is over. An identical declaration of principles was established at the San Francisco Conference in 1945, which created the United Nations, and specifically the regional commissions. The Economic Commission for Latin America and the Caribbean (ECLAC) in particular has made the analysis of development an ongoing theme for reflection and empirical study.

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[4] At some point, we should return to the expression "territorial development", to co-validate it in the tradition of Perroux, as the best way of conceptualizing development, which has always been, is and always will be a territorial and not an abstract phenomenon.

[5] This section reproduces part of an article by the author entitled ***Desarrollo (local): ¿de qué estamos hablando?*** *(Local Development: What are We Talking About?)*, published in several journals and books (see bibliography).

Initially the concept of (economic) development was associated with growth. For example, as cited by Solari, Franco and Jutkowitz (1976: 91), José Medina Echeverría, the Spaniard considered to be the father of Latin American sociology of development, states that [translated from the Spanish]: *"Economic development is an ongoing process whose essential mechanism consists of the repeated application of surplus to new investment and which, as a result, leads to the constant expansion of the productive unit in question. This unit may of course be a whole society…"*

O. Sunkel and P. Paz (1970) take the same position when they list the characteristics or current approaches to development (they were writing thirty years ago), underlining the identity linking growth and development.

For two decades, development remained virtually synonymous with growth and aggregate GDP. Above all, *per capita* GDP was the current measure for the level of development. This helped to consolidate the professional dominion of economists over the field of development, something that generated a sort of vicious circle of economic reductionism, which has contributed little to understanding the true nature of the phenomenon and the design of effective ways of promoting it.

In the late sixties, the British economist Dudley Seers produced a revolution in terms of development with his well-known article on the meaning of development.

According to Seers (1970) the starting point for any discussion about development is to recognize "development" as a normative concept, full of value judgments. He himself wondered about the source of these value judgments, differing from Tinbergen's reply (the government) and the proposal implicit in social modernization theory (copying the path to development followed by other countries) and he also rejected ultra-liberalism, which would involve letting every individual introduce her or his own value judgments. Seers, heavily influenced by Gandhi, argued that we must ask ourselves about the conditions necessary to realize human potential, something commonly considered to be objective. Based on this question, Seers points to <u>food</u> as an absolute need (immediately translated into <u>poverty and income level</u>). A second basic condition for personal development is <u>employment</u> and the third is non-discrimination or <u>equality</u> understood as <u>equity</u>, and here, as a result, a subjective, intangible element appears, because the concept of equity has so many dimensions, as ECLAC's work (1990) has indicated, for example.

Finally, Seers states (1970: 33) [translated from the Spanish]: *"The questions to ask about a country's development are therefore: What has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If all three of these have declined from high levels, then beyond doubt this has been a period of development for the country concerned".*

Another two decades would go by before the United Nations Development Program, inspired primarily by the ideas of Amartya Sen, Mahbub ul Haq, Richard Jolly and others, introduced a new meaning and a new way of measuring development, using the concept of a <u>Human Development Index</u>. Since early in the 1990s, the UNDP has systematically published the result of the empirical application of this concept in countries and also at the sub-national level, enormously enriching the idea of development.

As the 1996 report indicates (55/56) [translated from the Spanish]: *"Human development can be described as the process of expanding people's options… Beyond their needs, people also*

value benefits that are less material. These include, for example, freedom of movement and expression and the lack of oppression, violence or exploitation. People also want to feel that life has a purpose, and a sense of realizing their own potential. As family and community members, people value social cohesion and the right to affirm their own cultures and traditions."

From the conceptual point of view, the Human Development Index (HDI) attempts to approximate a measurement for the human development of individuals in different countries, as the Chile report, 1996, indicates. For methodological reasons, this Index does not include all the areas associated with the concept of human development, focusing on just three of its components: quality of life, longevity, and knowledge. These dimensions, associated with population living conditions, but also indicators for health and education, themselves reflect the evolution over time of many other variables. As a result, the study concludes that these constitute a synthesis of the different elements making up Human Development.

In the case of health, life expectancy at birth is measured. For education, today median years of schooling for people over 25 years is used. Finally, the Index considers the availability of economic resources, measured using purchasing power based on per capita GDP, adjusted for the cost of living. It is important to underline the different nature of the variables included in the Index, some of a "stock" and others of a "flow" nature.

Once again, one must point to the growing "subjectivization" and "intangibilization" of the concept of development and its measurement, something that cries out for a real paradigm shift.

In the mid-nineties, the then General Secretary of the United Nations, Boutros Boutros-Gali published a report called <u>An Agenda for Development</u>, 1995, including a chapter by the same name, corresponding to the Report of the Secretary General A/49/665, 11 November 1994. In this chapter, the Secretary General defines five dimensions of development, definitively moving this concept to the intangible plane and thus opening the door to professionals from disciplines other then economics to work on development. Sociologists, political scientists, psychologists, historians, ecologists, anthropologists, and cultural professionals now find new scope for their work. Inter- and multi-disciplinary approaches began to abound.

The dimensions introduced by Boutros-Gali were:

1. *<u>Peace as the foundation</u>. Traditional approaches to development presuppose that it takes place under conditions of peace. Yet that is rarely the case....Development cannot proceed easily in societies where military concerns are at or near the centre of life.*

2. *<u>The economy as the engine of progress</u>. Economic growth is the engine of development as a whole....Accelerating the rate of economic growth is a condition for expanding the resource base and hence for economic, technological and social transformation...It is not sufficient, however, to pursue economic growth for its own sake.*

3. *<u>The environment as a basis for sustainability</u>. Development and environment are not separate concepts, nor can one be successfully addressed without reference to the other.*

4. *Justice as a pillar of society. Development does not take place in a vacuum, nor is it built upon an abstract foundation. Development takes place within a specific societal context and in response to specific social conditions....People are a country's principal asset. Their well-being defines development.*

5. *Democracy as good governance. The link between development and democracy is intuitive, yet it remains difficult to elucidate...In the context of development, improved governance has several meanings. In particular however, it means the design and pursuit of a comprehensive national strategy for development. It means ensuring the capacity, reliability and integrity of the core institutions of the modern State."*

In this brief summary of the history of the concept of development, it is essential to include a proposal, intermediate in time, published in Spanish in the special issue of the periodical, Development Dialogue (Dag Hammarskjöld Foundation), which represents, in the opinion of many, the best proposal for true development. Unfortunately, it never managed to move beyond the barriers of the academic world. This is the proposal known as Human Scale Development, in the version developed by Manfred Max-Neef, Antonio Elizalde and Martin Hopenhayn (1986), economist, sociologist, and philosopher, respectively, which is rather indicative. In the authors' own words [translated from the Spanish]: *"Said development [human scale development] concentrates on and is sustained by satisfying fundamental human needs, generating growing levels of self-reliance and the organic articulation of human beings with nature and technology, of global processes with local behaviors, of the personal with the social, of planning with autonomy and of Civil Society with the State."*

The extraordinarily contemporary flavor of this definition must be recognized. In fact, most of the concepts discussed below could simply be referring to this definition. In particular, there are innumerable points of coincidence or at least similarity between this proposal and its language and the proposal put forward by Boisier (2001/b) about synergetic capital and territorial development, although both were formulated completely independently of each other.

In "human scale development" one advances toward the subjectivization of development, unconventional resources are categorized (notably similar to the different types of "intangible capital" used by Boisier) and the use of synergy as the engine of development is underlined. These similarities speak for themselves in a period of paradigmatic transition, as Kuhn would undoubtedly argue, a transition characterized by the fact that the members of the same community of knowledge, with no contact among each other, start to raise the same doubts, to explore the same new paths, to invent similar neologisms, to formulate new and similar proposals.

This last reflection leads to another, of particular importance, already mentioned. To the degree that it is recognized that development is a complex, profoundly axiological, multidimensional, constructivist, qualitative concept in its essence, and consequently intangible as well, the scientific paradigm that has ruled the scientific development of modernity, associated with Isaac Newton and the laws of celestial mechanics, Francis Bacon and the experimental method as the only basis for scientific knowledge, René Descartes and analytical reasoning all cease to be useful in understanding development, because they are based on a reductionist, mechanical and linear paradigm. Understanding development requires holistic, systemic, complex and recursive approaches. Morin, Prigogine, Capra,

Drucker, Fukuyama, Habermas, Luhmann, Maturana and Varela are some of the names that begin to arise in association with this new paradigm.

The practical question, which should interest development _practitioners_, among which the most important are local authorities themselves, is that this requires real mental re-training to permit intervention, with some likelihood of success, in encouraging development and not just growth. A gigantic and essential task lies ahead for the academic community to build complexity's own paradigm into the pre- and post-graduate curricular structure.

Speaking precisely on social subjectivity and human development, the UNDP sociologist, P. Güell (1998) rightly stated that [translated from the Spanish]: _"Development that does not promote and strengthen collective trust, recognition and feeling, in the short term lacks a society to sustain it. Thus, the viability and success of a development program will depend on the degree to which people perceive that program as a scenario that recognizes and strengthens collective subjectivity."_

The same author has written a paper whose section titles are extremely interesting. These state that: 1) People and their subjectivity are not an additional resource, but rather an essential requirement for development; 2) Recognizing social subjectivity does not mean building defenses and refuges from globalization, but rather strengthening the ability to manage it; 3) Highlighting collective subjectivity as an objective of and the motor driving development should not lead to voluntaristic populism; 4) Decision-making for development cannot be technocratic, because it involves uncertainty about public diversity and discernment.

Emergent properties, neuronal synapsis, social energy and complex territorial systems. A heterodox look at development

At least in Latin America, the evident lack of success in efforts to provoke real processes of social development during socially acceptable time spans, justifies the audacity of dissident essays.[6] These distance themselves from repetition and routine, tend to support rupture and avoid orthodoxy, as A. Hirschmann suggests in conversations about a life spent "crossing borders" (1999:111).

To start, perhaps it would be useful to repeat something stated by this author in a previous work (Boisier, 2000/a) in terms of an irreducible territorial logic, which reveals itself throughout history in the process of development. The author expresses this as follows [translated from the Spanish]: _"If these propositions are right, then development starts as a local phenomenon that is both small scale and definitely endogenous. But to be able to fully unfold as an endogenous process, it is already well-known that it must first become decentralized. And then, from that moment on, development starts to expand from the bottom up and sideways, in a capillary process [...] Two resulting models can, from then on, illustrate the geography of_

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[6] It should be noted that recent "successful cases" (meaning those that in general terms occurred after the 1940s in the 20th century) of territorial development in Latin America, for example, the province of Neuquen in Argentina, that of Córdoba, also in Argentina, the administrative region (_departamento_) of Santa Cruz de la Sierra in Bolivia, the province of Concepción in Chile, some states in southern Brazil, the administrative regions (_departamentos_) of Antioquia and Valle del Cauca in Colombia, the Mexican state of León, the state of Ceará (in process) in Brazil, among others, are almost all the result of external and internal forces (the State and the region itself) combined with local efforts, rather than central policies prevailing.

development: expansion like an oil stain […], expansion following the design of an archipelago, or, in an extreme case, the strict pathology of center-periphery" (2000/a: 105).

And if, as the title of this paper openly suggests, development is not obtainable through the sum of actions, but rather through a simultaneous quality that makes it arise, what makes it emerge? Where are we going with this?

The response is, in principle, simple: if this were the case, we would have to rethink development (the process and the state of realization at any given moment) in light of a more systemic approach to reasoning. Concretely, it would be necessary to think more deeply and work more on the issue from the perspective of systems theory[7] and that would quickly lead us to suspect that development – territorial as it is – is nothing more than an emergent property of an adaptive, complex, dynamic territorial system, which is highly synergized.

If validated, the theoretical and practical implications of a hypothesis like this one are enormous.

The title of this paper is no accident: quite the contrary, *What if?* seeks to situate the question of development fully in the center of the field of complexity and simulation. As Arthur Battram said in his noteworthy book "*Navigating Complexity*" [translated from the Spanish]: "*Computer simulation is a well-used resource in researching complexity: it makes a new kind of scientific probing possible and answers questions of a What If? nature, with repeated iterations to analyze all the possibilities of a situation*" (Battram, 2001: 129, author's emphasis).

Emergent properties are defined[8] as "social and cultural phenomena that emerge from interactions and exchanges among members of a social system."[9] Some examples of this perspective are group roles, standards, values, ends, understandings, shared experiences, shared vocabularies, etc. *"General properties may emerge from the system's communication with itself as a function of intentions or ends, or emanate from its relationship with its environment"* states Nieto de Alba (1998: 129) [translated from the Spanish].

Another definition suggests that emergent properties are functional characteristics inherent to an aggregate object. They are essential to its existence: without them, the aggregate object does not exist. More formally, an emergent property is a unique functional characteristic of an aggregate object that '*emerges*' from the nature of its components and the forced relationships that develop and link them to the set. This functional characteristic arises from the aggregate and cannot be found in its parts. A region is not the sum of its provinces or sectors.

I believe Prigogine has been credited with pointing out the paradox derived from the fact that we live in a world full of emergent properties, without realizing it, and without understanding any of them. Everyday phenomena such as intelligence, consciousness, our three-dimensional sight, love, life, the rainbow, water's dampness, the watch's ability to demonstrate the passing of time, etc., are all emergent properties of different systems that reach varying levels of complexity.

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[7] This is not much of a novelty, really, because among others, Jay Forrester was the first to look at the city as a system in the 1960s.

[8] There are numerous definitions, but they are all virtually identical.

[9] http://faculty.washington.edu/lolswang/html

I have often, for educational purposes, used a very simple example to understand this concept. I am referring to a fashion some years ago of preparing some very colorful squares formed by an enormous number of multicolored dots (something like impressionism in painting) which had to be looked at in a certain way to see a figure underline. Note that an analytical or segmented perspective does not produce the sought after effect; only a holistic view can achieve this.

C. Gershenson (2001) says that we can define as *levels of abstraction* the levels that we can identify in a simple system (with no emergent properties, because the system is composed of elements that do not interact with others: single elements within the system possess all the system's properties). When different simple systems start to interact, they begin to form increasingly complex systems, until today's science cannot predict the behavior of the system with a computer. This phenomenon is referred to as *emergent complexity*. But eventually regularities start to occur within the system; it *organizes itself,* and when we perceive new repetitive phenomena we can associate them with a concept, name, describe and understand them, because the system has become simple, due to *emergent simplicity*. Then, as the simple system interacts *emergent complexity* appears, and so it goes, successively.

Complex systems explain how it is that new (emergent) phenomena and properties can form from elements' interactions within a system. These properties do not arise from nothing, because the elements are not present. They arise from the interactions among elements. Thus, we can explain the mind emerging from many interactions at different levels: between nervous system neurons, between the individual and the world, between different individuals, between the individual and society, and between the individual and her or his culture. Here we enter the field of *variety* (complexity) that Gell-Mann (1995) classifies as *algorithm or rudimentary complexity* of a random nature, and thus not compressible, and *effective complexity,* which has to do with the non-random aspects of a structure or process.[10]

Variety is the measure of a system's complexity. The number of states that a system can produce is a measure of its variety and therefore of its complexity. In a very simple case, a domestic refrigerator can only produce two states: cold and not cold, thus variety and complexity is minimal, just two.

An organization composed of many elements, people for example, can produce such an enormous quantity of possible states that predicting the system's behavior becomes impossible, almost chaotic, threatening the system's own existence.

This means that very varied and therefore very complex systems, such as a regional society, must be underline organized, provided with regulations that permit some degree of predictability in their conduct. This means that organizing always implies controlling, in the sense of disposing of a capacity to foresee the system's behavior regardless of its diversity or complexity. This reasoning is found in the basis of Ashby's Law of Requisite Variety.

There are three ways of dealing with the problem of controlling a system. One can *reduce the variety*, using mechanisms that cut down the interactions among the system's elements, reducing possible states. In social systems, these reducers are regulations, values, customs,

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[10] I saw the physicist, Murray Gell-Mann, in an interview on Chilean television in which he tried, with enormous humor, to explain complexity by describing the designs of several ties that he had in his pocket, from the traditional ones with stripes (low complexity) to more surrealistic ones (high complexity), indicating, moreover, that they were all famous brands.

laws, cultural norms, etc. Alternatively, *variety can be increased*, thus raising the complexity of the control element to bring it in line with the controlled system. For example, in the case of the household refrigerator, its control element is the thermostat, which possesses more variety or complexity than an electric switch, because it interacts with the refrigerator. Thus, by moving from the switch to the thermostat variety increases. It should be noted that this second possibility, of constant amplification, can lead to practical situations that are unmanageable, so *reducing variety or complexity in the environment, accompanied by an increase in the variety or complexity of the system* is the best way to avoid chaos. There is a third approach to controlling the system: *absorbing variety*. It is said that in the West the traditional method of control is reducing complexity, while in China complexity is absorbed, all this reflecting different cultural patterns.

These questions seem too abstract and removed from the concrete problems of a territory's development. Nonetheless, globalization, by the openness to trade that it produces in countries and regions, places territories in a very dangerous relationship with what becomes their new environment: the world. Viewed as a system that is naturally larger than any country or region, this world is infinitely more complex, thus forcing smaller systems to *increase their complexity*, *reduce the complexity of their environment*, *or do both at the same time* to avoid their disappearance due to "immersion". In other words, the increase in complexity will become a major player in every territorial development strategy. This issue of the complexity of a system and its environment constitutes one of Niklas Luhmann's main concerns [translated from the Spanish]: *"one must distinguish between the environment of a system and the systems in the environment"* (Luhmann, 1997:52). For many territories, globalization can be as dangerous, metaphorically speaking, as the lamp's flame to the moth... if the approach is not very intelligent!

According to David Byrne (1998), systemic complexity not only highlights the non-linearity of real processes (as opposed to mathematical models); moreover, real processes appear in evolutionary form. This means that we are dealing with processes (and one in particular: development) that are fundamentally historic in nature. They are not temporarily reversible and this is particularly interesting in the case of development, as can easily be understood, because once a society "places" itself on the virtuous road to development, it is unlikely to experience a regression. Two Spanish anthropologists write [translated from the Spanish]: "*Newton's physics speak of trajectories that can be expressed as equations. If all the initial conditions are known, these trajectories are predictable and reversible… In these equations, time does not exist… Biological evolution, in contrast, is an irreversible process*" (Arsuaga and Martínez, 2001:331). The same occurs with development, which in the language of chaos theory seems to be an "attractor", provided this concept is understood not in its static form but rather as a dynamic "path". Thus, as the positivist paradigm, strongly Newtonian in influence, opened spaces to political, economic and social models[11] based on *reversible time,* the new paradigm of complexity, operating with *irreversible time,* will have to generate congruent economic and social models, among them, the *development models,* which we are searching for.

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[11] There is no better example that the previously famous "gravitational models" of Walter Isard and the Regional Science School of Pennsylvania, where many of us were trained.

The concept of *neuronal synapsis*, from neurophysiology, is another concept that could be extremely useful in the field of development.

The synapsis (from the Greek for *link* or *union*) is the contact without fusion between the axis cylinder of a neuron and the cellular body or dendrites from another at whose level the nervous impulse is transmitted from one cell to another. Apparently it involves a chemical and electric transmission. Intelligence seems to be a direct function of the density of cerebral synapsis. The human brain is thought to contain about 100 billion neurons, although each neuron has only 10,000 contacts with other neurons and these contacts are not continuous, but rather intermittent, as Charles Francois describes it.[12] Intelligence is considered an emergent property of neuronal synapsis.

This is an interesting point. The same author has explored the analogy between neuronal synapsis and globalization[13] (Francois, 2002), stating that [translated from the Spanish] "*In itself, globalization contributes emergent properties, that result from interactions that transform a collection of uncoordinated elements into a coherent and functional system. This emergent contribution results from the synergies produced when hitherto unconnected elements come into contact.*"

In a recent paper on decentralization presented to an international seminar held in Medellín (Colombia)[14] I used a variation of the title of that magnificent film by Stanley Kubrick, from the novel 2001: Space Odyssey, to narrate the "the odyssey of Latin America's territorial development" based on the fantastic anthropological metaphor from the start of the film, in which primates as a tribe suddenly appear transformed into *homo sapiens* upon touching a strange basaltic monolith, which produces in their brains (I assume this was the message) a gigantic and immediate synapsis.

If one thinks about social development[15] it is not hard now to understand that this is a dynamically complex process and concept,[16] where complexity is understood to refer to a situation where many elements, sometimes difficult to describe and therefore generating high uncertainty due to their enormous variety, interact. Murray Gell-Mann, who won the Nobel Prize for Physics, has argued that complexity can be understood as the difficulty in identifying regularities in a system. People asked what they understand by "development", would probably list a series of issues such as housing, work, education, health, social security, income and perhaps some more profound areas such as culture, solidarity, respect for difference, alterity (otherness), etc. These persons would probably not be able to identify the numerous interactions (synaptic articulations?) among the elements they have named, but for specialists it is clear this is not simply their sum.

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[12] Charles Francois, Honorary President of the *Asociación Argentina de Teoría General de Sistemas y Cibernética-GESI* (Argentine association of general systems and cybernetic theory), Buenos Aires, Argentina.

[13] I would like to say that the first person I heard refer to globalization as "a systemic emergence" was Federico Bervejillo, a distinguished young Uruguayan architect, while studying at ILPES (Bervejillo, 1996).

[14] International Seminar, Los estudios regionales (Regional studies) in Antioquia, Medellín, 6 - 7 June 2002. The paper is called 2001: La Odisea del desarrollo territorial en América Latina (2001: The Odyssey of Territorial Development in Latin America).

[15] I deliberately use this concept, which is broader and different from "social development" and also, of course "economic development".

[16] It would be better to say "complex dynamic system".

In truth, we are simply saying that development depends on interaction, that is the connectivity and interactivity among several (many) small scale processes ("local" scale, in the language of complexity) and factors, for example a culture (we'll explore the implications of this below), trusting relationships, the role of institutions, justice, freedom, socialized knowledge within a community, knowledge and skills "embedded" in people, health, sentiments and emotions that limit and direct a supposed instrumental rationality, self-confidence, symbolic elements that constitute forms of power, etc.

The above is included in the concept of synapsis. As mentioned, synapsis is connection, connectivity, transmission of "signals" (chemical, electric, informational, and others). When, as occurs in the case of some regions in Latin America, "modern" medicine joins forces with "traditional", "tribal", "ancestral", "natural" or whatever we want to call it medicine, a synapsis occurs: information is exchanged.

But just as occurs in the brain where intelligence appears as "emergent", a large number of binary connections is not enough. Gradually one must build a high-density network, a veritable web of connections across which information can flow. Synergy?

On this point one must refer to the concept *neuronal synchrony,*[17] which is very similar to that of synergy. What I find extraordinarily suggestive, after reading an introduction to the subject (Aboitiz; 2001), is the fact that the human brain seems to be able to work in analytical and synthetic cognitive categories both simultaneously and sequentially, something that should be developed with regard to our ability to intervene in reality (for lack of development, for example). Aboitiz quotes Thompson and Varela (2001), who state that [translated from the Spanish]: "*...consciousness arises as an emergent property, that is, a global process that arises from the non-linear dynamic of local interactions, which generate top-down (global to local) processes that moderate the system's general dynamics*" (Aboitiz, 2001:285).

Eric Sommer (1996) defines the concept of synergy as [translated from the Spanish]: "*a system of interactions between two or more actors or centers of action.*" Any set of two or more beings who interact could be considered synergy. Synergy arises when two beings interact or work together in any way and for any reason. For synergy to arise, a common purpose is not necessary. According to Sommer, synergy surrounding a common purpose is in a class of its own known as "organism" or "organization".

Synergy includes a set of beings. Each of these beings contributes a particular nature to synergic interactions. This nature that beings impart to their synergic interactions involve all their potential and availability, including the experiences, beliefs and objectives that are part of their world views. Besides beings and their world views, synergy also contains their interactions and the interactive patterns that develop among these beings. Finally, synergy includes the particular use that participants make of others, as means or instruments. Participants in synergy serve each other as instruments or means to the extent that they function as mediators or means by which other participants in the synergy interact with each other.

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[17] I am indebted to Dr. Ricardo Rosas, Director of the Catholic University of Chile's School of Psychology for introducing me to this concept, profoundly linked to the last work by Francisco Varela, who died recently. In any case, the balance of reciprocity with Ricardo Rosas remains in my favor, due to the not minor fact that he married my daughter.

Sommer indicates that [translated from the Spanish] *"an organization or organism is 'a synergy with a common purpose'. By 'organization' or 'organism' I mean a set of beings co-adapted and coordinated to achieve a common goal. 'To organize' therefore is the act or process of coordinating and co-adapting a set of participants to achieve a common purpose."*

This coordination or social consensus is achieved <u>by introducing energy</u> into a synergic context. The nature of the energy may vary enormously: patriotic and national sentiment in the case of military conflict; solidarity where catastrophe has struck; the promise of playful satisfaction in a game; the material or immaterial recompense involve in other situations; n-achievement à la McClelland, etc.

At this point I would like to introduce the concept of *cognitive synergy* developed a couple of years ago as part of an experiment in participatory regional development (Boisier, 2000/b). I have defined *cognitive synergy* as the collective capacity to carry out common actions based on a shared interpretation of reality and its potential for change. This means we are talking about external energy in the form of a cognitive framework that is assumed by those participating in the synergy and this cognitive framework interweaves possible actions with current, contemporary knowledge, that is it interweaves action with the *knowledge society's* own knowledge. This is an issue of enormous importance because now stimulating development anywhere requires considerable new cognitive inputs. The relationships between territorial management and knowledge in a Knowledge-based Society have been explored in depth by this author recently (Boisier, 2001/a). This concept (cognitive synergy) can be understood as *negentropy*.

As these conditions cannot be achieved through traditional educational procedures (this is not about "lecturing" social agents, although this method could be recommended at other times), the only way to generate this cognitive synergy[18] is by incorporating processes of *professionally structured social conversations,* so that all issues end up framed precisely within the constructivist paradigm and the use of language, the word, discourse, to create actors and projects.

It is precisely on this point that Gershenson (op. cit.) notes that when forming societies (organizations, Sommer would say) to achieve common ends, means of communication are developed: <u>languages</u>. For there to be language, there must already be certain conceptual constructions. These concepts are simply formed by repeating an experience and where a language is available the concept is assigned a name. Concepts can be more or less abstract and language allows them to be transmitted and discussed. Language permits concepts to survive down the generations that evolve at the same time. These concepts represent <u>knowledge</u> and the accumulation of knowledge gives rise to <u>culture</u>. The influence of Pierre Bourdieu's thinking is clear.

The process referred to as *social conversations*[19] seeks to generate a language based on certain conceptual constructions (hypotheses about growth and development within a territory), with this language becoming socialized knowledge about the nature (structure and

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[18] Ultimately, this translates into the generation of <u>social power</u>, since "power arises only where people act together", as Hanna Arendt said.

[19] On the notion of <u>social conversations</u> about development it is important to review some UNDP (United Nations Development Program) reports on Chile, particularly the reports on <u>Human Development in Chile</u>.

dynamics) of the processes mentioned above, a knowledge that will then play the role of *symbolic power in favor of whoever holds and exhibits it.*

The dialogue located at the very center of every *social conversation* is in itself a special type of conversation. This dialogue is about *emergence*: the birth of new meanings and commitments. *"Dialogue is the tool that permits exploration of the space of possibility"* [translated from the Spanish] (Battram, op. cit.: 58). To generate a successful dialogue, which produces emergence, one must respect three basic rules requiring: 1) respect for the person, "maintaining the context" at any point in the dialogue; 2) suppression of the tendency to judge or worse, pre-judge; 3) consideration of all points of view as equally valid.

Gradually specific tasks begin to take shape that must be included or strengthened in a territory for *development to emerge*: the <u>first</u> is to introduce complexity into the territorial system (region, province, municipal area, or whatever), for example by expanding the variety of activities and organizations, providing institutions with a high level of hierarchy (decision-making autonomy) that allows them to establish regulations, stimulating a greater division of labor (and accepting the accompanying uncertainty), expanding the web of connections, increasing interactive flows, raising the proportion of operations (of any kind: financial, commercial, technological, etc.) that begin and/or end within or outside of the system; the <u>second</u> is to favor *synapsis*, that is, the transmission of information between the system's components by creating networks and through the use of traditional means of distributing information (stimulating the densification of the mass media); the <u>third</u> is to introduce *exogenous energy* into the system such as, for example, knowledge, and enhancing *endogenous energy* (socialization of tacit knowledge, collective self-esteem, self-confidence, etc.).

What kind of management system is necessary to generate development?

The central proposal summarized here is that development may be an emergent property of a *complex territorial system*. Complex in the primary sense of being difficult to predict and, because scientific definitions focus on what is predictable, it will be difficult to define and work with complexity in traditional scientific terms. Here lies the importance of subjective factors and art, in its broadest sense, to development, and the management of development itself.

But we are talking not only of a complex territory. The socially organized territory that forms the physical and psychological basis of development is also a *complex, dynamic, dissipative and autopoietic adaptive system.* The constant tension between order and chaos, called "complexity", is the result of two dynamic processes that constantly interact: the <u>autopoietic need</u> to conserve identity, to constantly recreate oneself, to resist change and center oneself internally, and the <u>vital need</u> of all living beings to change, to grow, to explore limits and to focus on the outside. A complex adaptive system *learns as it organizes itself.* *"It seems that a complex adaptive system is "adaptively intelligent", always seeing and imagining models, testing ideas, acting on them, rejecting them again, always evolving and learning"* [translated from the Spanish] (Battram, op. cit: 33). In this sense, development cannot be anything but the result of interactive adaptation with the environment, the product of sub-systems independent of the complex adaptive systems that seek to improve their conditions in an ongoing dialectic between centrifugal and centripetal (autopoietic) forces.

Again, Nieto de Alba [translated from the Spanish]: *"All self-reproducing systems, be they individual or social, consist of dissipative structures, open to each other, and only capable of maintaining themselves and growing interdependently… The sustained growth of a dissipative system requires the ability to convert energy and information from the environment into more elaborate forms of internal structure, at the same time as internal disorder is moved out to the environment"* (1998:129/130). Thus, these systems (such as the territorial system that we have in mind) are characterized by a dynamic tension between eliminating entropy and accumulating negentropy; if the balance is favorable, the system evolves through internal growth.[20]

In any given territorial system is it possible to identify the local sub-systems most relevant to generating development? This is basic to introducing synapsis, complexity and synergy so that *development emerges.*

If we examine the many contributions of a varied nature that have helped to identify elements that seem to act as causes of development and use them in a taxonomic exercise to groups them in relatively homogenous categories, we can identify six in particular.

Louis-Joseph Lebret (1969:23/24) used to say [translated from the Spanish]: *"Most experts [in development] do not dare to face the question of values or, as a result, the optimum human objectives that must be proposed… Some authors on development suffer from short-sightedness in their metaphysical conceptions. They are imprisoned by a theory of possession and extending possession, when in reality this should all be subordinated to being-more and a theory and a practice of being-more should be developed that includes the civilizing use of possession… For us, what counts is the man, every man, every group of men, all of humanity. The objective of development cannot be anything but the authentic development of men themselves."*

Here there is sufficient support to start to identify a set of values as the sub-system that defines the starting point for the search for development, remembering as well that D. Seers in *The Meaning of Development* began his proposals by underlining the axiological nature of development.

I think it is necessary, when we speak of development in a territory (nation, region, etc.) to distinguish between certain *universal* values such as freedom, democracy, justice, peace, solidarity, equality (or equity or the absence of discrimination), ethics, aesthetics, heterogeneity and alterity, without which development in general would be unthinkable, and another set of *singular* values, peculiar to the territory in question, which are values intrinsic to identity, which provide inner unity and distinguish and separate from what is outside. Without this second set it would be impossible to configure a strong *imagined community*, which is what makes the territory itself the main identifying reference point and makes internal solidarity and cooperation viable, because, "although we don't know each other personally, we are from the same place," which is the sense that B. Anderson (1991) gave to this concept. When we speak of values today, we refer to names such as J. Rawls (justice), A. Sen (equality), D. Goulet (ethics), M. Levinas (alterity) and others, as Parker (1998) shows.

The actors, be they individual, corporate, collective, public, private, make up a second sub-system, with the actors being the carriers of development. As we have said in previous

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[20] More regulations and greater variety of activities on one hand and growing cognitive synergy on the other.

studies, it is not enough to appeal to the actors in a purely abstract sense. The genuine <u>agents of development</u> among them must be selected, those with projects and plans, with real power to influence the course of events, those who must be identified exactly in order to convoke them at the right opportunity[21] (in terms of complexity, agents are elements able to determine their own behavior).

<u>Organizations</u>,[22] public and private, make up a third sub-system. The elements of this set include *objects, properties and conduct.* I mean that we are not just interested in a list of organizations operating in the territory (which would be the objects), but also fundamentally the evaluation of their properties or characteristics in relation to their contemporaneousness. This refers to the speed of their decision-making processes, the flexibility of their response to changing demands from their environment, and their malleability,[23] resilience, identity with their own territory and, above all, their organizational intelligence (properties). Finally, we are also interested in establishing the pattern of inter-organizational relationships in order to evaluate the climate of cooperation or conflict among them (conduct).

The <u>procedures</u>, that is the set of ways by which the local government governs, administers, informs and positions itself in its own territory, define a fourth sub-system. Further along we will discuss the true sense of "governing"; for now, it should be pointed out that "to administer" is a routine procedure that connects the government to population on a daily basis by providing services, and it is also a procedure for allocating resources, once the objectives have been established.[24] On the other hand, and this is very important in the framework of the Knowledge and Information Society, social actors today feel overwhelmed by the speed, massiveness and entropy of contemporary information, a question which drives them to take conservative economic positions because of the growing uncertainty and high transaction costs. No one but the local government itself can assume the task of gathering in this information flow, restructuring it in an orderly function in terms of its own social objectives (which are being formulated at the same time), to return them in this way to their own potential users, reducing transaction costs, uncertainty and asymmetry. Similarly, no one but the government can lead the ongoing task of positioning its own territory in the new context of globalization, as it does, sometimes, regularly, at the national level.[25] Clearly, today administration is more complex than it used to be.

Accumulation or <u>economic capital</u> constitutes an obvious fifth sub-system, but with the caveat mentioned above, that is that without denying the importance of articulating growth and development processes, there is no hierarchical and linear or simplistic relationship and this articulation is characterized by an unknown complexity. But it is obvious that for all that development may be intangible, several aspects of this intangibility require a solid and expanding material base. Without a sufficient and efficiently applied net flow of investment, a

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[21] This is to identify them, by name, surname, address, participation in the social fabric, etc., in order to rank them according to their quota of power. It must be remembered that, aside from revolutionary situations, development can only be activated with the support of existing powers and cannot be attempted in opposition to them. Contrary to the conclusions that might arise from a superficial, ideologically-inspired analysis, this is not a conservative position; rather, the challenge is precisely this, to create associations and open sum games.

[22] In the sense that Sommer gives this concept, as "synergies with a purpose".

[23] Capacity to adapt their own structure to their environment.

[24] It should be remembered that "administration does things <u>suitably</u>, while leadership does <u>suitable</u> things."

[25] Specialized bodies, such as the governmental agency ProChile in the case of Chile and many others in different countries.

developmentally oriented practice cannot be sustained. One important question to keep in mind is that in the context of globalization, with the extraordinary mobility of productive factors, particularly financial capital and technology, territories' endogenous capacity is limited. In fact, in terms of decisions determining the behavior of growth factors in sub-national spaces (capital, technology, human capital, national project, economic policy, external demand), growth is exogenous and this has made governmental attitudes toward these factors very different from those of the past. Governments today must be extraordinarily pro-active.[26]

I have intentionally left the most important sub-system to the sixth and last place, if we accept the intangible nature of development as a temporary state and process. This is intangible capital, a broad set of specific factors that can be grouped into relatively homogenous categories, whose importance is not only receiving growing recognition, but also derives from the most elementary logic. In effect, if one admits the intangible, subjective and even asyntotic nature of development (with regard to the imaginary axis of its own realization) it is necessary to recognize causal factors or independent variables that must have the same dimension, because clearly no amount of alchemy can change lead to gold. In black and white: development is not caused by material investment, but rather by actions that realize the potential of phenomena that are primarily found in the field of social psychology, as Alain Peyrefitte (1997:28) put it [translated from the Spanish]: "*We find it hard to accept that our way of thinking or behaving collectively can have material effects. We prefer to explain matter by matter, and not by manner.*"

This intangible capital is generally of a nature that horrifies economists, because its stock rises as it is used, that is, it behaves exactly the opposite to the resources described in economic theory.[27] More than four decades ago, A. Hirschmann described something similar when he spoke of "moral resources" and, of course, some of these intangible kinds of capital are very much in fashion, such as social capital. The author (Boisier, 2001/b) has proposed ten categories: cognitive capital, symbolic capital, cultural capital, social capital, civic capital, institutional capital, psychosocial capital, human capital, media-related capital, and, the most important to the ideas proposed in these pages, synergetic capital. Names such as Bourdieu, Putnam, North, Williamson, Schultz, Fukuyama, Montero, Becker, Coleman, Hirschmann, and many others are behind these concepts.

Unfortunately, there is not enough room here[28] to carry out a detailed analysis of these kinds of capital, although this is the most important category in this context.

What we have on our hands at this point is, figuratively speaking, a "development hexagon".[29] Here is where we must establish synapsis, create synergy and introduce energy.

In terms of values, it must be said that to turn them into active elements of development a mere declaration of support is not enough. On one hand, historical research is necessary to

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[26] In other essays I have spoken of the movement away from a "trapper's culture" toward a "hunting culture" as a metaphor for governments' changing attitudes.

[27] Solidarity is a simple, immediate example.

[28] Academic magazines, the natural vehicle for circulating these kinds of ideas, are increasingly limiting what is "acceptable" for contributions and it is not strange to receive a request to cut an article "in half" as if it were a sausage.

[29] Somewhat more refined than the author's proposal some years ago (Boisier, 1996).

rescue and bring to light the *singular values* of the territory in question[30] and permanent discourse is necessary to keep support for both *universal and singular values* alive. What percentage, for example, of the population of Chile's Maule region declares its support for the value of alterity, that is, difference, the "other" or "not-me"? What does it means to this population to be "Maulean" or what does "Maulinity" mean as a value? What does it mean to be *paisa* in Colombia, that is, to be from Antioquia? None of this can be assumed to be mere data in the problem. These are variables to create or rescue and reinforce. <u>Without values, there is no region and no development</u>. The importance of the education system, the media, and universities or research centers appears clear and synaptic articulations must be introduced among these elements, even if they are binary at the start.[31]

On the actors, I have already indicated that work with actors requires moving down from the abstract to the concrete, discovering agents and their relative power (ILPES years ago developed a simple but powerful methodology, based on a sociogram and known as the ELITE software, to identify the set of agents with power and rank them). Individual actors must be encouraged to group together according to their common interests, corporate bodies to federate, and collectives to make the up-to-date and modern supra-sectoral discourse on development their own.

With regard to organizations, it must be remembered that these serve mainly as the basis for building up the *capacity to associate*, a key type of synapsis in today's context of globalization and the knowledge society. The capacity to associate can take different forms: between public and private sectors (for building partnerships), among companies, government and the world of scientific and technological research to make collective and innovative learning processes possible, among companies and value chains to generate groups or clusters, and among territories themselves to give rise to *associative regions and virtual regions.*

In terms of procedures (government, administration, information, positioning) the task consists of closely linking modernization processes in the four areas mentioned (for example, introducing computer systems into the government must improve service provision and also "position" the territory better on the map of globalization, while better management of information must directly serve the function of government, as well as promotion, and so on).

The effort to attract capital by making the territory more competitive *internally*, that is enhancing its ability to attract capital and technology, must be professional and systemic, linked to the creation of a *corporate image, a logo, a driving force.* This task depends on culture and its own development project, combining past and future. It also requires scientific knowledge of several issues, among them the location requirements for different manufacturing activities (much more sophisticated than in the past), possibilities for the technological development of regional resources, international standards and codes governing capital and intellectual property, etc. All this must be included within an effort to *promote and publicize or market* the territory (Caroli; 1999).

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[30] If they do not exist, one must admit there is no real region, in the sense of being an organized territory potentially capable of developing itself endogenously. There are only <u>territorial </u>bits, which are arbitrarily called regions. In this case, not even a government is necessary, since there is nothing and no society to govern. Only an administrative body is necessary, that can perfectly well be deconcentrated, as in Chile.

[31] The Colombian historian, María Teresa Uribe has written (2002) an interesting paper on Antioquia as an "imagined community", which is very relevant to this discussion.

Within the varied set of intangible capital, mentioned here as the most important development factor, synaptic actions are multiple. Much of intangible capital naturally maintains the intrinsic articulations with varying strength, for example, cognitive and cultural capital, social and cultural, civic and institutional, etc. What is important is to move from binary to multiple connections through the role assigned to synergetic capital.

Energy and information (negentropy), which must be introduced into this increasingly complex system to ensure its development, is represented by cognitive synergy based on a process of social conversations.

Can a traditionally structured territorial government carry out these task? I think the reply is clearly no, as does Yehetzel Dror (1996:77) [translated from the Spanish]: "...*And the available forms of government are not suited to managing the needs and opportunities in a constantly changing world.*" Perhaps the most severe limitation on the role of sub-national governments in terms of encouraging development lies in their practical inability to think, reflect and dare in the long term.

It is easy to attribute this limitation to budgetary and personnel restrictions, but experience demonstrates that in many places, Chile among them, there are public technocrats (especially in regions) with a real <u>terror of innovation</u>, which reflects cultural patterns that look negatively at the innovator and may even go so far as to socially punish innovation (through mockery, marginalization, loss of employment, etc). These patterns are typical moreover of authoritarian attitudes that permeate every sphere of work;[32] in these conditions, proposing changes or innovation entails taking enormous risks as a functionary and can easily lead to "the re-crucifixion of Christ", a reference to the novel by Kazantsakis (*Cristo de Nuevo Crucificado,* 1938). All this, moreover, becomes magnified in enclosed, small-scale social and bureaucratic worlds, as occurs in sub-national areas, in which even the authority person is too close, physically and hierarchically speaking.

Several other reasons prevent sub-national governments from playing the role imagined for them. Most were mentioned above, but I will add another here. I am referring to the fact that in many cases the organization referred to (by law even) as the "regional government" is no such thing. It is not empowered to govern in the political sense of the term, because it has no capacity for social leadership, lacking legitimacy in the eyes of the people and real authority to identify the path to the future or make decisions, for example, that could mean <u>conflicts of power with the national government</u>. It therefore cannot design a development project that to some degree could diverge from or even directly contradict national proposals, and must submit to a completely counterproductive level of mimicry and reduction of scale.

It is not necessary to be a creative genius to note that development, which is essentially the management of a development project, requires political power. This is obvious, as is the reminder that political power is not made of immutable stock and its distribution does not necessary reflect a zero sum game between national and sub-national governments. Power can undoubtedly be transferred, but <u>mainly it is created through social consensus and the unification of political forces</u>. As Hanna Arendt said [translated from the Spanish]: *"Power arises among people where they act together…"*

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[32] This is very apparent in Chile and was undoubtedly particularly true during the 17 years of military government.

But while this process unfolds, and this always requires a medium time frame, even within the limited room to maneuver available to it, any territorial government can create a management unit to look out for the long term, to develop thinking and actions for the long term (which obviously starts today). This would lead to a radical division of tasks in the government's organizational structure, ultimately separating <u>administrative</u> from <u>development</u> tasks, separating the short from the long term, separating the contingent from the substantial.

This unit, with a high level of professionalism, must be concerned with the prospect of building long-term scenarios (Medina, 2001), social conversations, strategic alliances, long-term investment flows, territorial planning, scientific and technological research, the creation of synapsis, synergy, interaction, energy, permanent monitoring of progress in realizing the potential of the territory's intangible capital, in a word, development rather than growth. Of course, if this unit's professionals are not deeply trained in systemic analysis, complexity, the use of diffuse logic and other similar fields of knowledge, they will not make much progress. As Stiglitz suggested in one of the above quotations, if there are no mental changes it will be impossible to achieve development. Because success depends on understanding and implementing the conditions that make systemic emergence possible.

I realize that, as with any proposal for changing routine practices, at first glance this one may appear to be unviable. But an independent force exists that can help: the "new economy" and Information and Communication Technologies (ICT), which, by forming electronic networks such as the Internet, enormously facilitate synapses in systems such as an organized territory and information flows between nodes on the network. Perhaps trying to achieve a permanent drive to development, such as that described here, would be impossible without a technology like the Internet.

Recently, the government of Chile announced the results of a survey representing almost 80,000 companies (using a sample of 3,134 companies) that attempted to measure access and use of ICT among Chilean firms (Ministry of the Economy, 2002).[33] The companies were classified as small, small/medium, and large, and 12 sectors were defined. The main results show a predictable distribution in the use of ICT by size (for example, 53% of large companies have a web page compared to just 10% of small firms), but most revealing was companies' use of Internet. Seventy percent use Internet to deal with the bank, 67% to deal with government services, 35% to deal with suppliers, and 30% for contact with their clients. The main information flowing along the company-bank connection was the review of account statements, while in the case of governmental services it was primarily tax returns and payments. Interconnections between companies mainly revealed information flows on prices and offers, while with clients the main flow was information exchange. These and other aspects of the survey reveal a certain cultural pattern, not surprising in Chile's case, which gives priority to <u>vertical flows</u>[34] over more complex and horizontal synapsis. Although the study examined the business world, some extrapolations toward more aggregate worlds are possible. This reveals the undeniable difficulties involved in the proposed focus, which would be useful to hide.

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[33] In this study, ICT included computer, a commuted connection to Internet, a dedicated connection to Internet, and broad band.

[34] This is perfectly congruent with the well-known authoritarianism of Chilean culture, even in the business sphere.

Governments, other social bodies such as business organizations mainly, and universities are perfectly aware of this, although their initiatives to get companies into networks or speed up the implementation of "electronic government" are motivated mainly by efforts to improve productivity, competitiveness, cost structures, and business administrative practices, more than aggregate development as such. It does not matter. Ultimately, all these objectives contribute directly or indirectly to development and once an interactive network (a synapsis) has been established it will not be difficult to turn it into a synergy (as you will remember, give it a common purpose: development) and introduce the energy necessary through this.

I suppose it is not difficult to agree that a proposal such as this falls within the area of praxis, the exercise of *linguistic constructivism*, that is, using the word, the language and discourse in the systemic creation of actors and projects. The sociologist, Rafael Echeverría (2000:37) [translated from the Spanish] stated: "*It has been recognized that language has an active and generative power. It is what we call the transforming power of the word… through it we generate new objects and products, we transform the world, we open or close possibilities, we build different futures*" (author's emphasis).

Thus, ultimately, the "development hexagon" referred to has the following sub-systems at its vertices: 1) accumulation; 2) decision-making; 3) process-related or procedural; 4) axiological; 5) organizational and; 6) subliminal (this last, in reference to the different kinds of intangible capital normally perceived at the subconscious level). All these vertices are connected by a powerful and dynamic synaptic web through the cognitive synergy introduced into the system.

One last technical (or ontological?) question: Is development a chaotic process? Of course, given that "*disorder is activated by the multi-dimensional nature of order*" [translated from the Spanish] (Colodro; 2002:34). I leave further exploration of this question to the reader.

The proposal presented here is not easy to implement. In the history of humanity, the dream of flying has always existed in people's minds and its practical realization too, it was just that this last required a permanent, combined process of creating both knowledge and action. Dedalus and Icarus may be said to have failed, but humanity did not fail in its dream and not only do we routinely fly, aided by mechanical inventions, but also we stand on the threshold of tele-transportation of energy and, eventually, matter.

The dream of development, of wellbeing, of justice, equality, solidarity, friendship, has existed forever in the human mind as has its realization. If, in the relevant territorial spaces we manage to bring together complex thought, knowledge, common action, and political power, development will arise as it is: a property of a socio-techno-economic, territorialized, complex, dynamic, adaptive and synergized system, based on which it will have to be channeled for distribution throughout the territory in a fair, efficient and environmentally friendly fashion.

It is possible that the final objective still remains distant in time. After all, it is worth recalling Aristotle's comment that [translated from the Spanish]: "*Wealth of course is not the good that we are seeking, because it is nothing more than an instrument for achieving another end*" (Nichomachean Ethics). We are still confusing means and ends.

DEVELOPMENT AS AN EMERGENT PROPERTY OF A SYSTEM.

SIX SUB-SYSTEMS, SYNAPSIS AND COGNITIVE SYNERGY
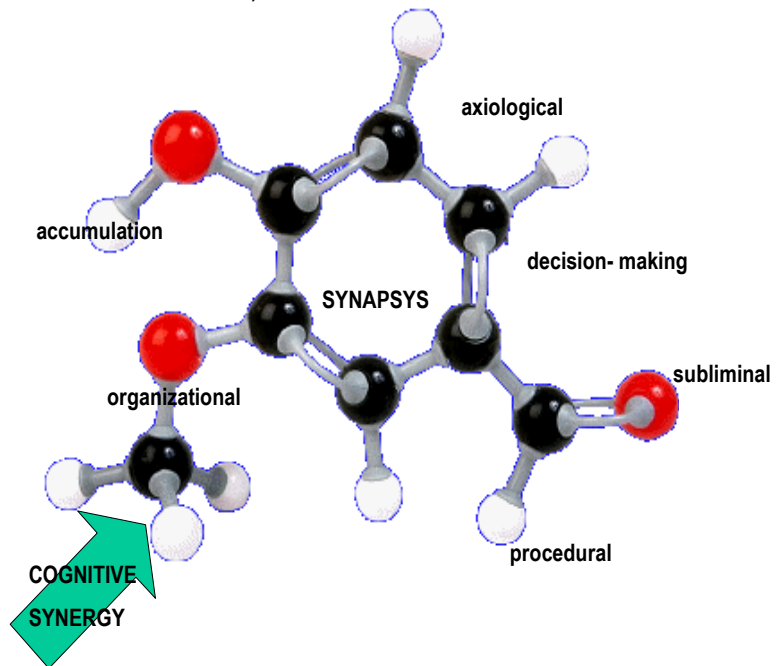
Bibliography

Aboitiz F. Sincronía, conciencia y el "problema duro" de la neurociencia," <u>Revista Chilena de Neuro-Psiquiatría</u>, 2001; 39, Santiago, Chile

Anderson B. <u>Imagined Communities: Reflections on the Origin and Spread of Nationalism</u>, VERSO, 1991, London

Arsuaga J. L. E I. Martínez. <u>La especie elegida</u>, Booklet, 2001, Spain

Armstrong H.W. "European Union Regional Policy. Reconciling the Convergence and Evaluation Evidence," in J. R. Cuadrado-Roura and M. Parellada (eds.), <u>Regional Convergence in the European Union. Facts, Prospects and Policies</u>, SPRINGER, 2002, Berlin, New York.

Battram A <u>Navegar por la complejidad</u>, Ediciones GRANICA S.A., 2001, Barcelona, Spain

Bervejillo F. <u>Territorios en la globalización. Cambio global y estrategias de desarrollo territorial</u>, ILPES, Essay series, 1996, Santiago, Chile

Boisier S. "Em busca do esquivo desenvolvimento regional: entre a caixa-preta e o projeto político," <u>Planejamento e Políticas Publicas</u>, 13, 1996, IPEA, Brasilia

Boisier S. "Post-scriptum sobre desarrollo regional: Modelos reales y modelos mentales," <u>Anales de Geografía de la Universidad Complutense</u>, # 18:13-35, 1998. Madrid

Boisier s. "Desarrollo (local): ¿de qué estamos hablando?" in <u>Estudios Sociales</u> # 103, C.P.U., 2000/a, Santiago, Chile. Also in Vázquez Barquero A. and O. Madoery (editors) <u>Transformaciones globales, instituciones y políticas de desarrollo local</u>, HOMOSAPIENS Ediciones, 2001, Buenos Aires

Boisier S. <u>Conversaciones sociales y desarrollo regional</u>, Editorial de la Universidad de Talca, 2000/b, Talca, Chile

Boisier S. <u>Knowledge Society, Social Knowledge and Territorial Management</u>, Instituto de Desarrollo Regional (IDR), Fundación Universitaria, Documento de Trabajo nº 5, 2001/a, Seville, Spain, http://www.idr.es/publicaciones/economía

Boisier S. "Territorial Development and the Construction of Synergetic Capital: A Contribution to the Discussion on the Intangibility of Development," in Kumssa A. and Terry G. McGee (eds.), <u>Globalization and the New Regional Development Paradigm</u> (New Regional Development Paradigms, Volume 1) 2001/b, Greenwood Press, Westport and London

Boisier S. 2001: La Odisea del Desarrollo Territorial en América Latina, paper presented at the international seminar, Los Estudios Regionales en Antioquia, Medellín , 6-7 June 2002, Colombia

Boutros- Gali B. <u>An Agenda for Development</u>, (Report of the Secretary General A/49/665, No. 94), United Nations, 1995, New York

Byrne D. <u>Complexity Theory and the Social Sciences. An Introduction</u>, Routledge, 1998, London

Caroli M.G. Il Marketing Territoriale, Franco Angeli, 2000, Milan, Italy

ECLAC La equidad: enfoques teóricos y sugerencias para su estudio, Doc. LC/R.595, 1990, Santiago, Chile

Colodro M. Reflexiones sobre el caos, Editorial Universitaria, 2002, Santiago, Chile

Dror Y. La capacidad de gobernar. Informe al Club de Roma, F.C.E., 1996, Mexico

Echeverría R. La empresa emergente, la confianza y los desafíos de la transformación, GRANICA, 2000, Buenos Aires

Francois C. El modelo neuronal de la globalización emergente, 2000, http://www.concytec.gob.pe/ias

Frondizi R. ¿Qué son los valores?, F.C.E., 1945, Mexico

Furtado C. A Nova Dependencia, Paz e Terra, 1982, Sao Paulo, Brazil

Gell-Mann M. The Quark and the Jaguar: Adventures in the Simple and the Complex, ABACUS, 1995

Gershenson C. Filosofía de la mente e inteligencia artificial, 2001, http://www.cogs.sussex.ac.uk

Guell P. Subjetividad social y Desarrollo Humano, 1999, http://www.iigov.org/pnud

Hirschmann A. A través de las fronteras. Los lugares y las ideas en el transcurso de una vida, F.C.E., 1999, Mexico

Lebret L-J Dinámica concreta de desarrollo, HERDER, 1969, Barcelona

Lindblom C.E. "The Science of Muddling Through," in Ansoff H.I. Business Strategy, Penguin, 1969, London

Luhmann N.Sociedad y systema: la ambición de la teoría, PAIDOS, 1997, Barcelona, Spain

Max-Neef M., A. Elizalde and M. Hopenhayn "Desarrollo a escala humana" en Development Dialogue, special issue 1986, Dag Hammarskjöld Foundation, Uppsala, Sweden

Medina J. La Imagen y la Visión de Futuro in los Estudios del Futuro, Pontificia Universidad Gregoriana, Fac. de Ciencias Sociales (doctoral thesis), 2001, Rome, Italy

Ministerio de Economía, Chile Acceso y Uso de las TIC en las Empresas Chilenas, 2002, http://www.economía.cl

Moncayo E. Nuevos enfoques de política regional en América Latina: el caso de Colombia en perspectiva, multiple copies, ILPES, 2002, Santiago, Chile

Nieto de Alba U. Historia del tiempo en economía, McGraw Hill, 1998, Spain

Parker C. (ed.) Etica, democracia y Desarrollo Humano, LOM Editores/CERC-UAHC, 1998, Santiago, Chile

UNDP Informe sobre Desarrollo Humano 1996, Mundi-Prensa Libros, S.A., 1996, Madrid and Desarrollo Humano en Chile 1996, UNDP, 1996, Santiago, Chile

Seers D. "The Meaning of Development," Revista Brasileira de Economía, 24, 3, F. Getulio Vargas, 1970, Río de Janeiro

Sen A. Desarrollo y libertad, Editorial Planeta, 2000, Barcelona

Solari A., R. Franco y J. Jutkowitz Teoría, acción social y desarrollo, Siglo XXI Editores, 1976, Mexico

Sommer E. The Mind of the Steward: Inquiry-Based Philosophy for the 21st Century, 1996, Vancouver, Canada (http://www.newciv.org/ISSS-Primer/Seminzlk.html)

Stiglitz J. "Participación y desarrollo: Perspectivas desde el paradigma integral de desarrollo" in Instituciones y Desarrollo # 7, IIG (Instituto Internacional de Gobernabilidad), UNDP/Generalitat de Catalunya, 2000, Barcelona

Sunkel O., y P. Paz El subdesarrollo latinoamericano y la teoría del desarrollo, Siglo XXI Editores SA, and Editorial Universitaria SA, 1970, Mexico

Tomassini L. "El giro cultural de nuestro tiempo," in Kliksberg B. y L. Tomassini (comps.) Capital social y cultura: claves estratégicas para el desarrollo, IDB, 2000, Washington

Uribe M. T. Historia Política y Región. Un modelo para armar, paper presented at the seminar, Los Estudios Regionales en Antioquia, Medellín, 6 - 7 June 2002.