

## Territorial development: between innovation and technological change

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### Resumen

La mayoría de los estudios regionales coinciden en que los análisis sobre el territorio refieren por esencia a un espacio geográfico determinado, el cual conlleva en sí mismo determinados elementos naturales como sus plantas, animales, montes, valles, ríos o lagunas; es decir, todo territorio o región ostenta una serie de recursos que lo caracterizan y le dan vida. Sin embargo, si la región la redujéramos al aspecto geográfico, posiblemente centraríamos su análisis en el relieve o altura de sus montañas, en sus montes, valles, a la composición de sus recursos energéticos, o a la variedad de su flora y fauna, es decir, se destacarían esencialmente sus aspectos naturales, y se dejaría de lado la presencia humana, lo cual implicaría una visión pasiva del análisis regional. Sin embargo, a pesar de que puedan existir lugares en los que no exista la presencia de individuos, su análisis o estudio requiere necesariamente de la figura por lo menos de quien investiga. Existe entonces una diferencia entre lo que se considera “la región” y lo que se aborda como “regionalización”. La primera categoría implicaría la existencia real y objetiva de un espacio determinado, la segunda, la forma en la que se emprende por el investigador o como se apropian sus habitantes de ese espacio y como se gestan sus interrelaciones, que por lo demás está decir, resulta una tarea ardua hacerlo en toda su dimensión o magnitud. Es decir, resulta muy complejo estudiar una región en la que se abarque todos sus aspectos: físicos, biológicos, naturales, políticos, sociales y culturales al mismo tiempo. Ya que a pesar de que su

abordaje es por excelencia un estudio multidisciplinario, en todos los análisis que se realizan, se potencia el punto de vista de una de las disciplinas del saber.

**Palabras Clave:** Región, producción, cultura, trabajo.

### Abstract

Most regional studies agree that territorial analysis essentially refers to a specific geographical area, which carries with it certain natural elements such as plants, animals, mountains, valleys, rivers, or lakes; that is, that all territory or region boasts a number of resources that characterize it and give it life. However, if we reduce the region only to the geographical aspect, we possibly would focus the analysis on the relief or height of its mountains, its valleys, the composition of its energetic resources, or its flora and fauna variety; that is, highlighting its natural aspects and leaving aside any human presence, which would imply a passive vision of the regional analysis. Although there may be places where the presence of individuals does not exist, the analysis or study of that place necessarily requires at least of the presence of the person in charge of the research. Therefore exists a difference between what can be considered “the region” and what can be addressed as “regionalization”. The first category involves the real and objective existence of a determinate space. The second category contain the approach made by the researcher or the way that inhabitants appropriates a space, and how their relations emerge –an arduous task to do in all its magnitude–. It is very complex to analyze a region that covers all its aspects at the time: physical, biological, natural, political, social, and cultural. This complexity exists because even though its analysis is multidisciplinary, in all possible analysis we can make, the point of view of one discipline will always be enhanced.

**Key words:** Region, production, culture, work.

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## Introduction

In social science, it is impossible to study a region or regionalize a space without the presence of human beings. We cannot consider the region as an island, independent of humans. It is necessary to incorporate the action exerted by multiple factors, such as the legacies from the past, the characteristics of the population, the political-institutional relations, or the socio-cultural relations. That is why the regional studies are methodologically discriminative, which does not makes them limited or without meaning. This actually serves to orient research lines that demands to determinate what is going to be researched and why; in other words, which are the thematic contents to be addressed. However, we should not forget that regional studies necessarily leads to the comprehension of the territory as an integrated unit, whose dimensions are at the same time economic, political, social, historical, and cultural.

In consequence, regional studies are models that allows us to analyze a phenomena that arise in a given space, and which characteristics makes it different (or similar) to other regions. The perspective we intend to establish in this paper relates with the analysis of the regional development, and for that purpose, we consider a dynamic and systemic vision of the region and the regional. In this vision, the elements from an economical nature have a great weight, but they are not attach to these indicators or variables, because in order to boost development, the economical elements are not enough, and it is necessary to consider the social and cultural aspects as well as the political, the administrative or the environmental ones.

A particular element of analysis for this paper is to examine the role played by the technological innovations, and the use of new technologies in the regional development process. From our point of view, the technologies does not work in abstract but they work correlated with cultures and specific knowledge from the actors who promote them, use them, or drive them.

Some interpretations questioned the role that the use of technologies took from the productive systems, e.g. cheaper –or replace –the workforce, punishing workers with a

more intense exploitation process, or generating a bigger dependency to the countries where there is not capacity to promote, encourage or support scientific research.

This paper stands on the idea that technology by itself is neither positive nor negative, but that we give it substance in the way we use those technologies, under what conditions and what perspectives. In this sense, we consider that technology contributes to the local development process only if the technology is associated with the process of transference and productive chains at the interior of a region, and when is assumed, appropriated and interiorized by the social actors of that community.

In order to follow the present analysis, it is first necessary to clarify an idea that allow us to understand what it is and how we conceive the regional development, and the importance that technological innovations and new technologies have in this process. Secondly, we need to identify the social subjects or the institutions that enable, encourage or limit the regional development

### **Regional development**

The discussion on regional development is not new. Recovered from the classical model of economic development, it stated that the growth of the economies was the main generator of development, and that it was enough to foster an increase in the Gross Domestic Product (GDP) or to generate steady and sustained growth rates to stimulate it. From this perception emerged the binomial relation between development and underdevelopment, in which is stated that if some of the countries were underdeveloped it was due the fact that they had not modernized or because they lived under a technological backwardness.

Later, it was found that growth was not enough to generate economic development, but this problem is more related with a poor income distribution. For this reason, the Government intervention was considered necessary for the elaboration of distributive policies and for the substitution of imports, which gained strength through the Keynesian proposals from the welfare State and that many countries developed. However, the large fiscal deficit incurred by some countries –specially in Latin America –linked to high levels of inflation and the

called debt crisis, questioned the Keynesian proposal, which was replaced by the called structural adjust policies and the new Siren song for the supremacy of the market and the globalization.

Regarding regional studies, these took shape and importance, mainly through geographers, which linked the natural space with the humanized landscape (human geography), which later became known as economic geography or regional economy<sup>1</sup>. In this discipline, an impetus was provided originally to the theories of the location, which gave great importance to the location of economic activities in the territorial space, initially to agricultural activities and later to industrial and service sectors.

Later, that this was not considered enough either, so the state's participation through policies to promote the regions were considered necessary, and with this emerged the plans and programs for the regional development. Later, it was concluded the importance of giving a greater weight to the process of capital accumulation, investment, competition, productivity, innovation, and promotion and development of technologies. Detached from development theories, the consideration was that underdeveloped countries could join the "development train" if they could promote foreign investment and if they could encourage exports. Eventually, the theories of center-periphery emerged in Latin America and with them a new way of interpreting the regional.

Perroux somehow contradicted the theories of localization by revealing that development did not occur in a balanced way in all the regions. He determined, through the theory of the development poles, that certain industries installed in a given region became in promoters of development of a wider area, because from them it was possible to encourage the economic activity beyond the sphere in which they belonged originally.

With some variations, the theory of the development poles still has a strong influence in the regional studies. Nevertheless, recent investigations supplemented it with elements of local

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<sup>1</sup> The regional economy relates economic forces and factors in a given geographical area. The actions of the economic agents interacting in this space are the element of analysis, e.g. employers, consumers, and the State. Although, several analysis elements from national and international institutions were incorporated in recent years for the purpose of the called globalization.

or endogenous development policies, which emphasize the use of internal resources (e.g. natural, human, financial...) of a locality or a region.

Because of the process of globalization and cultural imposition, we are under a vision in which territoriality, locality and region tend to “disappear” or to become less important in the analysis. In this sense, we speak about the concepts of “deterritorialization” or “delocalization” hinting at the existence of a “global market” in which the communities lose the importance and the sense of being, because when you have these capital mobility and the inexistence of borders, even the Nation-states lose their sense or any need to be. Yet, reality has been the opposite, and the locality and the territory have been strengthened not just as analysis categories but also as essential components for the tasks of the local and regional life, due the fact that it is impossible to produce and reproduce outside of a specific geographical space or a local society.

From this brief reflection, we can group the regional development theories in two general categories: the first one of those who believes that the fundamental factors of development come from outside or are promoted from the outside, i.e. are exogenous based. The second category considers that the development determinants or drivers have an internal nature, i.e. endogenous (see Salguero: 2006).

We intended to highlight only some the theories, both exogenous and endogenous, that we consider important, although the specific interest is still how the innovation and the process of technological change boost regional development.

### **Regional development theories**

Classical thoughts have the idea that the region is a delimitation of an economic and social space, that is, how a given society establishes a model of production in a given geographical space, exploiting its natural resources, which implies an appropriation of the territory. However, the factor that determinates it as a “region” is the productive and reproductive process for the survival of the human species. In this sense, the region has its own personality and we should study it individually. For the operation of the concept it was developed initially the traditional visions of homogenous region, polarized region and plan

region or administrative. All three refer to single characteristic (homogeneity, polarization or public action) and it does not take in consideration the multiplicity of factors that interfere in a region. On the other hand, based on them it was how the most important advances in the regional analysis emerged.

Early theories considered external variables –as the investments– as essential elements for development. These external variables were the starting point to generate process of industrialization, and from the consolidation of them, promote exports. This gave guidelines that –rather than promote development– led to a dependency of underdeveloped countries to the developed countries, which is why in recent times had emerged new analysis based on internal capabilities of the region as engines of growth and development.

### **Exogenous based theory**

One of the first development theories of geographical-regional nature was the Hirschman's theory, which explained that in order to develop a country it is necessary to analyze case by case based on the exploitation of the resources of each region (Salguero, 2006). Hirschman held that development was based on unbalanced growth. In this sense, development is usually starts in one or in a few regions of the country, creating agglomerations that subsequently drive development in undeveloped regions.

Transmission forces would be the result of inter-regional commerce, plus capital transfers and innovation from the first region to second one. In this way, economic development of the first region cannot ever produce negative effects over the other regions. Added to this, Hirschman argues that the migration originated by the competitive advantages in human resources and the strong appeal of their economic activities established in the more developed regions favors the increase in the income per capita of the poorest regions via remittances, and in turn, these favors developed regions with a cheaper cost of labor and the primary resources that the region could have. Based on the theory of unbalanced growth, he argues that the less developed regions will continue existing besides the large regional clusters. However, optimism reapers when he argues that in the long term the crowds tend

decentralize due to external economies and based on relocation, which generates a complementarity between regions.

Fritz Voight (1964), who is also a supporter of the theory of unbalanced growth, says that the most stagnant regions hardly can recover the lost ground because their possibility of development will be limited by a process of thieving of its natural resources, whether physical, human or capital. At the most, they can trim differences if the poor area is specialized in primary activities in favor of the rich area, and through complementarity of this ones in order to generate industrial development that allow it to be independent.

Similarly, Myrdal (1964), who developed the theory of cumulative causation, argues that development in underdeveloped regions will not occur in a spontaneous way, and that the positive effects that come from agglomeration to the developing zones only can be possible as long as the development levels are high across the country. Myrdal foresees the need to encourage investments –both private and public –in order to create no so many agglomerations, and thus facilitate a development transfer to other regions of the country. To do this, he aims that equal opportunities and the development of a democratic system are necessary, and therefore economic analysis should be complemented by a social and a political analysis. His idea that growth is necessarily unbalanced, pushed in some extend the theory of uneven development, which attempt to explain the cause of the differences in development levels and rates among regions.

### **Endogenous based theory**

One of the first endogenous based theories belongs to Alfred Weber, and it is known as the theory of industrial location. We know that industry covers various activities, from extraction of raw materials to the production process, and at times, the sale of the final product (extraction, processing, installation and service). Localization, in the other hand, refers to the location in which one can have an amount of materials which can be ubiquitous, which apparently can be found in any part of the territory –such as water or sand–, or the located, that can be found only in specific spaces but are essential for the elaboration of good produced by an industry. These are the ones in which localization has a



greater weight with the transport prices. The relation of the industrial localization relates with the temporary changes in technology, or changes with the techniques, the productivity, the human quality and the markets.

The criticism against this theory is that it does not consider the costs for resource extraction, nor the costs and limitations of storage for products or used materials. Yet, in order to understand the industrial localization phenomena, it is valuable to realize the idea that development is driven from the very heart of the region.

Linked to this idea, Christaller develops the theory of the localization of the tertiary activities, which focuses the size and the distribution of the cities. Although it is started from an static space (homogenous surface, balanced demographic density, equal costs, similar supply for all the population and depending services form the market area), the services are located in a central point in relation with the clients, and generates maximum profit and an optimal supply.

Based on this, appears a hierarchy of urban centers, where the main ones are characterized by large settlements supported by activities of a highly diversify tertiary sector, in which the service industry is highlighted as the area with bigger influence. After this one, smaller hierarchies appear, corresponding to smaller settlements and smaller service areas. In the same way, the range's length determines the price of the products. The central place a single area, which has the bigger population, and then it continues hierarchically, the middle and the small ones.

However, if this theory considers the analysis of the industrial sector it distorts the urban structure of the city, but also explains the regional analysis, because although the function of the city is to provide services to the dispersed population, the unequal distribution of the natural resources and the people themselves, as well as different access to the markets and the disparity of such access, makes the offer limited to generate adequate services. Furthermore, industries tend to be located where resources, technological innovations and proper work force exist.

Another theory is Douglas C. North's theory of export base, which explains that the main element to develop a region is the ability to have a highly exportable production, not necessarily abroad but in other regions in the country. Through these export activities is possible to expand regional markets and to promote new production activities for both the local and the regional market. Such activity may be agricultural, tertiary, forestry, mining, or industrial. We can determinate the regional development rhythm depending on the type of activity. Undoubtedly, the growth will be bigger among diversify exports, which will make that most dynamic industries gets attracted by this region.

This theory, however, by promote the export factor neglects other factors such as government intervention through spending, investments and consumption generated in the region by fluctuations in migration, or leadership –regional politics, economics or entrepreneurship.

Certainly, one of the most important endogenous based theories is the theory of the development poles. Proposed since the fifties by the French economist Francois Perroux, the development poles theory explains the presence of industries that promotes development from where they are installed, generating spillovers to a wider region, so the investment in a developing pole affects other cities and regions in terms of employment, population and technology. It starts from the premise that in a geographical zone the industrial activities are stimulated in order to promote and economic activity for a broader area. Its main importance lies in the connection between growth, innovation and expansion (or dispersion) that geographical spaces generate. Without doubt, this is the theory that applies better for underdeveloped or developing countries. Perroux's main idea is progress, but this must be understood under three different but interrelated meanings: economic progress (when the richness volume increases), social progress (when the welfare of everybody increases), and technological progress (when the productivity increases through new technologies implementation). In this sense, underdevelopment should not be seen as a situational issue, but as a blockage to growth and as a domain of the more developed countries to the peripheral countries, and as a disarticulation of the structure of these peripheral countries (see Guillen, 2005). Disarticulation establishes an absence in the prices unit worldwide, and in the monetary fluctuations and information's dissemination.

Promotion of development under this perspective should be therefore endogenous, global and integrated. That is, to base everything in the internal strengths and resources, in a way that can embrace the completely human perspectives (social and cultural) and not just the economics, and that can integrate the differences and provide cohesion between regions and sectors.

The development poles theory as regional development strategy would imply then that a motor industry would have an advanced technology level and a high degree of concentration. This would also have to develop a big part of the productive factors and services (inputs) that would incorporate to the productive process whether workforce, inputs or natural resources of the zone. Salguero (2006) notes that develop poles are “an interlinked industrial complex around a dynamic central industry through a series of input-output linkages in the market (that) are used to support actions of regional policies aimed (...) to develop”.

Another element of the development poles theory says that products should be sold in different markets than its location. Hence, the industry engine should be able to transmit economic development to the surrounding area through a spillover effect (either positive or negative) towards its hinterland. The way to measure this development, would be primarily through the per capita income and the productive structure. However, one of the main criticisms of this theory is that market cannot contribute to the most backwards regions by itself, so is necessary government intervention through infrastructure, investment from state companies, or investment incentives through subsidies, preferential loans and incentives through tax reduction and the provision of public goods.

In these terms, the development poles theory is associated to the promotion of new business or institutionalized industries through public intervention and “planning<sup>2</sup>”, seeking better living conditions for the inhabitants in the surrounding areas. Those companies not only would produce changes in the hinterland through innovation, but also legal and political changes in the institutions of urban centers where they are installed.

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<sup>2</sup> In our assessment, the structure of the capitalist system cannot be planned, especially with the current development models that let the behavior of the economy in the hands of the supposedly free market forces.

Another problem that arises for the development poles theory is that its impulses are mostly done through imports of technology and external capital, which under the logic of the economics domain, developed by Perroux, does not promote the regional interest but the interest of transnational corporations, that from the regional or territorial perspective involves the phenomena of relocalization and deterritorialization in this era of globalization that doesn't support the regional development of a country.

A contribution to development poles theory was established by Schumpeter, He said regions could reach develop through the role played by innovations, which refers to several elements or forms for its promotion: 1) the productive use of an invention, which can occur with the introduction of a new good or by a simply change in quality; 2) new production methods, which not necessarily involve scientific discoveries; 3) the search for new markets; 4) find new sources of primal materials; or 5) the establishment of a new organization (Salguero, op cit., pp. 13-14).

From all these we can understand that territorial development, assumed as local and endogenous, requires of innovation processes to promote its own development. Still, it should be understood that innovation not only implies a technological<sup>3</sup>, but also an organizational dimension, as well as collaboration between business, market and government. We will come back to this discussion eventually.

### **Development should be local**

In this paper, we start from the idea that development can only be local. Based on Perroux's idea that growth does not appear at the same time everywhere, but in certain obvious points –or poles –, with different intensity and different mechanisms but into the economy as a whole (Boisier; 1006: 51), obligatory implies a geographical local phenomena, but not

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<sup>3</sup> To consider only the technological dimension in the innovation process, it will imply to establish the investments in I+D as the main indicator, which would leave out of the analysis to the small and medium enterprises that doesn't have any department or division in this area, even if they had a good capacity to innovate and to adapt to the new economic changes. .

necessarily a phenomena of national or global nature, as it doesn't exist any place in the world in which development was homogenous in a whole territory.

Even the considered most developed countries have economic areas underdeveloped or less developed than the rest. There are rich and poor neighborhoods in the United States and Mexico. Therefore, we would argue that development is uneven between regions. This makes that the center-periphery phenomena became not only a category of analysis among countries but also a correlation of forces within the same nation. We could also point that – according with dependency theory– development of some regions cohabits with the underdeveloped of other regions, whether for economic or political dominance of the prevailing institutions, unequal exchange between regions or dominion over markets. Considering that development is a homogenous phenomenon, it is rather the result of analytical abstractions that have been made out of the objective reality. In any case, a country is considered more developed than other because it has a larger area of its population and its territory under this developed condition.

In this regard, we believe that develop is –or should be– of a fundamental local matter, and that is interwoven not only with economic characteristics, but also social, cultural and technical from a specific place. It depends, in addition, to its own evolution or trajectory which starts at a given point –or possibly in several points, but not in all at the same time – and occasionally spreads over a wider area. which necessarily implies a territorial process, conditioned by the ability and willingness of its protagonists, its resources and potentialities, which can have more or less success, depending of the right interrelations of that local area with the national and international elements of development.

From this perspective, it is clear that the current globalization processes disrupt and modify the notion of region and regionalization, as previous joints between society and territory are transformed, which does not mean that the region disappear. Concepts like “deterritorialization” or relocation belongs to categories that explain the notions of the transformations suffered by the regions. These notions come from all previous interpretations but it does not mean that the concepts of region or regionalization are not used any longer, or that they do not serve to interpret the present. However, this should lead to referential variables that give operability to the concept itself, since this is not only an

“objective” and rational reality, but it’s, beyond anything, a lived space. From this perspective, the region is both a physical and a mental construction. For this reason, the region will historically continue expressing its importance, as the region –or the regionalization –is essentially the way in which human beings can relate with each other, with the nature, and with their economic, political and cultural surroundings. What allow us to keep talking about region and regionalization is “the fact that social groups build spaces for exchange and mutual identification, in which they perform preferably the activities that join them together” (Hiernaux-Nicolas; 2002: 429). Whether actions between human beings are social, economic or political, they will be actions limited by a geographical space, that is, “spatialized” actions.

Under this scheme of interpretation, the central column of this article is the thesis of territorial development, understood as a specific geographical local space, and therefore mainly promoted by endogenous factors as its natural resources (water, mines, agriculture, livestock), human resources (training, scientific and technological knowledge), economic resources (investment, capital accumulation, infrastructure) and cultural resources (tradition, idiosyncrasies). It is also believed that innovation and technological change play a determinant role in this kind of development.

### **Defining territorial development**

Territorial development is considered as “the set of social, cultural and economic processes that promote economic dynamism and improves the life’s quality of the population in a territory” (Boisier, in Amezcua; 2014: 67). However, globalization, technological advances and digital communication strongly influence this space and do not allow the territory to be isolated nor closed. External influences (politics, culture, or any other) have an impact and lead to change the region to a lesser or greater degree. In this sense, every territory must be analyzed as an open system because in it good and services are changed in other territories or nations. There are also external cultural and ideological influences (different ways to dress, to be and to live) that doesn’t end with traditions and idiosyncrasies, but do modify them through different mechanisms (media, consumerism, customs, innovation,

adaptation). Boisier himself had to expand the definition of territorial space, considering it as a set of attributes based in its economic structure and that affects the welfare of its population and its natural resources. A fundamental element of the territorial development is to overcome poverty, hunger and discrimination, and to promote political, economic and social freedom.

Please note that this definition rescues the essential elements of the human development, but also in the sense of the sustainability of the territory, that is, the rational use of the natural resources. Under this perspective, the territory is the main center and subject for development, but not as an independent actor or as an empty space that serves as a container for the scenery of the social process, but as the result of those processes; and it is built from them as a social and historical lived space, as a “process in construction made by its own territorial community, which means that the territorial community needs to be the author, manager and beneficiary of its own development” (Suárez; 2014: 38).

This development must be comprehensive, but also multidimensional and productively multisectorial, based on a schedule that considers the interrelations between the various actors, including the participation of the state through regional policies. For this reason, it must also be sustainable in its economic, political and social levels.

From an economic point of view, Boisier (in Amezcua) says that territorial developments depend on six basic factors: capital accumulation, knowledge accumulation, workforce accumulation, a national project with a high territorial profile, economic policies (sectorial, national, and global) and the demand (national and international). At the same time, he points to three different approaches for the local development: a) local development as a matrix for diverse industrial structures; b) local development as an endogenous process of structural change; and c) local development as “empowerment” of local society.

- a) The first one reformulates the localization theory, the agglomeration processes and the industrial districts, focusing it in the importance that local environment have, as well as the role played by innovation and competitiveness. Local development focused in the industrial structure is manifested in three modalities: 1) The industrial district “in the Italian way”, where the main element lies in specialization and

“coopetition”, a neologism that describes an industrial conduct in which cooperation is promoted in some links of the production chain while competition is promoted in others. 2) Innovative means “in the French way”, with is a collective operator that reduce the degrees of uncertainty of companies, and which is achieved through the functional interdependence of the local actors, performing functions of selection, codification, investigation, transformation and control of the information. Vázquez-Barquero considers that this “innovative environment” has three characteristics: i) Refers to a territory without borders, but forming a unit where the actors organize each other using the tangible and intangible resources to produce goods and services and exchanging communication; ii) Actors build a network, producing relations of interdependence and cooperation; iii) Local environment provides collective learning that respond to the always changing environment through some mobility of labor in the local market, exchange of technology of production, process, organization and commercialization, as well as the information flows or the strategies made by the local actors (Boisier; 2006). Finally, clusters “in the American way”, involving geographical concentrations of interconnected companies and institutions in a particular field (or sector). They can establish simultaneous attitudes of cooperation and competence, benefiting each member of the cluster as if it were operating at a higher scale or as an associate, without scarifying its own flexibility. As an example of this, the author mentions the wine in California, the leather in Italy or the chemical industry in Germany and Switzerland (ibid: 53).

- b) Local development as an endogenous process necessarily forces us to stablish some differences between the “local” and the “endogenous”, due that global development is considered as an endogenous process. However, for the localities, independently of their origin, the globalization process implies that decisions are made every time more in an “exogenous” way, due to the high percentage of economic policies that are not promote by the members of the location. Many of these policies are imposed by multinational organizations. In this sense, the true meaning of local endogenous development implies a process that completes its design, conception and implementation of a community in a given location. Local endogenous development



implies then, the capacity to transform itself economically, politically and socially, with the ability to promote its own ways of social learning that allows them to defend their internal resources and to face the exterior challenges, while is still possible to innovate at local level. All these necessarily implies to appropriate the surplus and reinvest it locally, but also to boost science and technology that produce modifications at the local system itself, so culturally must generate an social and territorial identity, now considered essential for local development.

- c) The local development as empowerment of the society involves its own territorial societies to assume competences that allow them to intervene in its own processes of change and evolution in the social, economic, cultural and politic areas. Therefore, it is necessary to have motivated and informed societies, with minimal knowledge to understand the new production processes generated by globalization, and that are able to be organized, due the fact that globalization is changing the ways that we understand public intervention and it's also implying international flows of capital and technology, and the expansion of the international markets and the competence, which generates localization of the decisions in one hand (attractive zones for the international capital), and in the other hand, an increase in the internationalization of economic interaction in which the territory cannot be isolated. For this reason, favoring of innovation process and permanent improvement of the process of knowledge should be promoted, due the fact that they facilitate the inclusion and the connection of the territories to the economy and the global culture (Amezcuca; op, cit.: 71).

It is clear that the process of globalization is not expanding in a homogeneous way to the interior of a national territory, neither to the rest of the countries around the world. It would be highly "globalized" regions, it will be another's that would reach that point only relatively, and another regions who will be aside, either by opposition, resistance or mismatch, and that will subsist as marginalized regions or that even could be impoverish by this process. In this sense, a nation can establish a mosaic of various responses and interactions with the outside world. However, there are global elements that affect the regions independently of their responsiveness, and that hardly can be detached from

themselves, which produces profound changes in the regional analysis. These variables are: 1) financialization of the economy, 2) new technologies that promote changes in the production systems, and 3) markets supremacy.

- 1) The new pattern of accumulation expands itself through the large dominant capitals that generate higher levels of concentration and centralization, being the money circuits, in its needs of reproduction, the ones that determine the new relations between central and peripheral countries. This financial process<sup>4</sup> marks a new phase of capitalist development, due the fact that countries with a lesser develop is what allows foreign investments. “Money not only performs in the formal circuits into the process of production and circulation, but also creates and enhances the forms of globalization of the capitalist economy” (Giron; 2010: 120). It is these money circuits what determines the insertion of the diverse sectors, with the variant that they move in a process of financial deregulation and liberation, which causes sometimes that not even the nation-states are able to control their own monetary supply, as they are now financial intermediaries (mutual funds and hedge funds), they are the protagonist of the called financing for the development.
- 2) Standardized production in big scale and with heave technology (Fordism style) is giving way to flexible production of rapid changes and light technology (Toyota style), which results that in some areas that produces similar goods cannot adapt or renew themselves and they cannot update to the schema of this recent productive activities, so they lose competitiveness, falling behind in the globalization process. It is clear, e.g., that the loose of competitiveness in the Mexican footwear industry was generated, among other things, because it has been replaced in its primal materials, that in Mexico were originally from cattle skin, and later replaced by the production of synthetic materials (new materials) that requires different machinery and, obviously, new ways of organizing the production.

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<sup>4</sup> Productive and banking capital merged in order to encourage investment for the development, giving origin to financial capital. However, in recent decades, supported by a deregulation if economies, it generated a separation between the productive and financial activities, returning mostly to the financial activities, and determining the new pattern of capital accumulation, which has encourage the speculative boom and the constant financial crisis.

- 3) About the markets, they arise as the central objective of survival in this globalization area, they not only involves to incorporate them to survive as flows for the delivery of new good and services<sup>5</sup>, but a new international division of labor based on in a new pattern of capital accumulation. This implies that these new markets also provides a cheap labor or a deep work insecurity, as well as a flow of invaluable richness from the natural resources from the periphery to the economic centers of commercial and productive power.

In this situation, territorial development assumes as strategies the efforts to boost technological change, to promote I+D innovation, and the capacity of organization of its social actors. However, the chance that this is achieved depends entirely of the factual territorial situations, so we cannot have only one answer. The experience gained in the region analysis, describe a range of situations in which promotion of the I+D has serious difficulties or limitations for its implementation. For example, there are regions that elaborate products of medium and high technological content, with a production process that is complex and orientated to foreign markets, and that have laboratories or departments that promote the research of new technologies; and there is other smaller regions with a small local production for local markets where there is a strong presence of small producers and micro industries –even informal producers –, who have production processes with light technology and that are located in urban or rural areas, in which I+D is impossible to promote. In Mexico, e.g., in many regions and companies, the use of technology is limited or comes from other country, or is bought primarily with foreign capital.

### **Technological changes and regional development**

In recent years, there has been increasing interest in analyzing the effects of technological changes in the economic growth and social development, but at the same time, it has been some attempts to overcome the commercial “determinism” that combines technology with industrial and commercial activities, in order to generate manufacturing processes or export

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<sup>5</sup> There are regions that because their low earning capacity, are not even interested to buy (import) new products, but they can contribute to the international flows of capital with their material resources (primal materials) and human resources (workforce) that requires the globalization process.

manufacturing products, or its optimization. Therefore, we should clarify that technological changes does not refers only to the devices that are discovered or invented, nor does it refers to the activities or processes carried out in a company or work unit, and nor the reduce of the experience, nor the knowledge of handling a new machine nor the “know-how”. From our perspective, technological changes mean an interrelation of all these factors.

### **Technological changes and territorial development**

Technology, as an explanation of growth and development, have its origins –in a more specific way –in the development theories of Robert Solow. Through a mathematical function, he stated that production depends from capital investment, the use of workforce and the technological level. Yet, technological progress was considered as an exogenous variable to the model, which was unsatisfactory because if the growth do not happens at the interior, then cannot be considered as growth.

Based on the ideas of Joseph Schumpeter on the role of technology –and innovation– endogenous development models were created. Concepts as knowledge-based economy, national systems of innovation knowledge management, technological learning, new vision of intellectual property, and technological paradigms, were some of the categories that were developed in the analysis of growth, innovation and technology theories.

We need to remember that Schumpeter’s main idea about the entrepreneur does not have its focus in the fact that he is the owner of the production or that he is the one who performing the investments. Schumpeter thinks that the entrepreneur is the person able to innovate, even if he is not the one who creates the new inventions. In other words, the entrepreneur is the person who promote economic growth (or development). In this sense, for Schumpeter, innovation is the establishment of a new production function. In addition, we need to think that innovation is the origin of all these cycles. In this regard, the main characteristic of the development of capitalism is the introduction of new combinations, an endogenous process that Schumpeter called creative destruction, and that constantly revolutionizes the economic structure of the system, in which the profit pursuit remains as the main objective.

In perspective, technological changes –understood as physical changes in equipment, tools, automatic engines, or inventions –are necessarily attached to the innovation process, involving its implementation, change in the production models, or different ways of doing a work.

Recently, authors as Luc Soete (in Aboites and Corona: 2011) place greater emphasis on the impacts of globalization. Soete considers that investigation and technological development are concentrated in a few leading countries, or in a reduced group of oligopolistic firms in very specific regions. The accumulative evidence in Soete's studies prove that technological change rather than reduce the gap between rich and poor countries, has expanded it in a bigger degree of concentration, centralizing the capital. This would suggest that developing countries could not drive technological changes.

This necessarily leads us to redeem the concept of endogeneity, which involves detecting own natural, human, institutional, and organizational potentialities, based in knowledge strategies, experience and territorial solidarity through the affirmation of the identity and an associative management between representatives of the government, private industries and education and innovation institutions (I+D centers), and to link them with the global markets.

Cuervo and Morales (2009) said that endogenous growth models have to do with the assumption that “growth directly depends to technological change, which is done by the decisions of international economic agents seeking to maximize their profits” (p.373). However, this “endogeneity” of technological change in the classic model is controlled by companies with increasing returns and imperfect competition, which leads to increase regional inequality.

That is, a truly endogenous model is based “on the territorial system of each locality where local resources (natural, cultural, human, technological, economic, institutional, and materials) forms its development potential, that is, the capacity to generate a certain amount of richness (material, human, cultural, or spiritual) to ensure... the raising in the level of welfare and progress” (Morett and Cosío; 2013: 139).

This development potential is related with other natural resources (land, forests, mines...) but also technological, enabling the exploitation of its productive infrastructure and workforce (skilled people in working age, with a level of education, training, and experience). To all this, we should add the cultural elements (capacity to learn, to innovate, to organize, and to adapt to new situations), the expertise –as Morett and Cosío mentioned– which involves a social learned knowledge and that permits a specialized work, sometimes even with an ancestral background. That is, regional growth is based in its conditions and interior dynamics.

Sánchez Pérez (1991) describes in a more profound way the relations generated between technology and space. In his analysis about innovations, he argues that “(1) new technologies are shaping up as one of the most dynamic areas of human performance in the twentieth century, but we cannot forget that every human activity takes place in a geographical area from which we take advantage of, but that also imposes constrains” (p. 191). A dual process of adaptation must also occur, as when new technologies are deployed they modify the space according with the needs of those new technologies. At the same time, the space, with its own characteristics, requires that new technologies adapts themselves, due the fact that they are implemented in several ways, according with the geographical space in which they are installed.

The author is right when he questions who is leading the process of technological innovation. The answer is clear and unequivocal: those who performs the management and the appropriation of the economic surplus i.e. profit. This means that when new technologies are installed, they produce changes in the economic and social structures, and its effect can be many and diverse.

One of the functions that change with the use of new technologies is the use of the space as a resource, as a provider of primal materials that can be modified (agricultural industries). Lands use can be transformed from extensive to intensive, the animal feeding can change, as well as its evolution (genetic engineering) or the use of the plants (biotechnology). Sánchez Pérez points out that with the new spatial division of labor generated by the use of new technologies, the traditional rural areas can transmute to rural-tertiary areas. Similarly, manufacture industries can use new materials (PVC or synthetic materials for footwear or

clothing production), or may simply stay outside the scope of modern technology if local raw materials are not undertaken or not transfer is generated in the place where it is installed. Furthermore, automation and robotic processes increase production levels without using a huge workforce, which promotes the growth of unemployment rates, which is –in Marxist terms –the increase in the industrial reserve army.

A function<sup>6</sup> -we shall call it self-defense of the space –that modifies itself and it is not widely studied in the analysis, is the environmental relation. If previously –e.g. with the conventional farming methods –was possible to achieve a relative conservation of the ecosystems, today, with the use of transgenic, biofuels and biotechnology this is seriously damaged. The technology is not transferred because it involves direct investment process (installation of multinationals) often turn out to be highly polluting, generating externalities that are never obligated to pay for, or they can usually be predatory with the natural resources, leaving the territory behind with a strong pollution in the air or the water, and natural resources insufficiency.

Yet, the use of new technologies is important, and it is possible to achieve it in benefit of sustainable development. Dutrénit (2011) analyses how some companies in developing countries have been able to achieve leadership through the creation of its own technological capacities. He points that the use of technology begins in embryonic forms, up to the construction of advanced strategic capabilities with a management and exploitation of a higher pool of technological knowledge in fields that are important to them. This depends on the ability of the countries to insert in a learning path to develop national technological capabilities, which are only possible through linkage in local, regional, national and international level.

According to other authors (Kim, Amsden and Hobday), in order to achieve this, it is necessary a process of “invert innovation”, which consist in the acquisition of technology, then assimilation, then socialization of its use, and–with a higher learning –its adaptation.

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<sup>6</sup> Perhaps the term “functions” is not adequate, but it is really useful for the analysis, because in the double process of adaptation described by Sánchez in which technology affects in the space but the space also requires that the technology adapt itself, we would say that the nature also “respond” or “defend itself”. Therefore, the human presence in it not only involves its domain but also its preservation, not only for the survival of the nature but also for the survival of humankind.

Subsequently, the use of the technology improves and it can be use internally, this is, “tropicalize” its activity, and finally it is possible to generate it into the country. As evidence of this, we have the case of the Asian emerging economies.

However, this analysis is not intended to be subject of technological determinism. As we already pointed, technology does hand in hand with the process of constant innovation, and in order to generate truly development, they should be applied at territorial, local, and endogenous levels.

### **Genuine innovation and territorial development**

Under a broader view of the concept of innovation, we would distinguish those interpretations that are considered restricted and that belongs exclusively to the technological dimension, and those that are considered genuine and that transcend the conventional categories of the use of technology.

“The analysis of the genuine territorial innovations constitutes a source of enormous importance to the better understanding of the factors and processes that lead to economic development and the enrichment of the theoretical heritage that is built around the concept of territorial development” (de León; 2010: 131). We cannot continue importing external instruments and strategies of development, it is necessary to promote our own experiences and to promote projects based in the appropriated values of a region. Genuine innovation is a prerequisite for development, and this have to emerge from the local social actors, combining the specific structural conditions –or the exogenous– with its culture, its traditions, its experience, its values and its knowledge in order to address them. The role is then focused on the own community, where knowledge is generated at social level and with the relationships with the government. This results in a participatory approach to all organizational instances –formal and at times informal–; this must be sustainable in competitiveness but also in cooperation and equity (coopetition).

In this sense, if we search for a more sustainable development in a region, that is at the time more inclusive and more democratic, we must first examine the regional reality, analyze it,



and consider that the changes experimented in it are not immune to the experimented changes in the international macroeconomic contexts, but there is an overlap between the different factors at national and transnational scale, which outline the transformations in the way of development and the industrialization levels that operate locally.

Nonetheless, it is clear that either development is local or it does not exist. For this reason, is important to rescue the concept of endogeneity, which involves the ability of the region to manage itself with its own resources in a given territory. In this sense, it is also clear that the resources as a concept embraces not only both human and material resources, but also those related with the experience, abilities, manual dexterity, local wisdom, and bonds of reciprocity or mutual aid.

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