1 - Introduction

This paper aims at contributing to the launching of Globelics - GLOBal network for Economics of Learning, Innovation and Competence building Systems. It explores the main reasons for establishing and participating in such a global research network and highlights the perspective of development. The paper takes up the discussion on the need and usefulness of the concept of system of innovation focusing particularly the case of Latin American countries and Brazil as proposed in the introductory chapter of a book organized and edited by authors. It is also based on the contributions of the authors to the First Globelics Workshop and the Seminar on Innovation Systems at Aalborg University during 4-6 November 2002 (http://www.business.auc.dk/ike/ike-attach/Globelics.htm).

The paper starts by developing two articulated points. The first is that the present transformations in the pattern of accumulation expose even more the limitations of traditional economic approaches; requiring the development of new theoretical, methodological and analytical frameworks to deal with them. The second is that the lack of a better understanding of the nature of these transformations has led to a number of misinterpretations and mystifications.

One main argument here is that these changes do not result from any neutral or natural progressive order; reinforcing the need of further advancing the understanding of their specificities and potential impacts to design the necessary policies to cope with them. The main policy implications and arguments of the discussion are presented from a Latin American perspective. The final item of the paper puts forward some lines of investigation for the global network on learning, innovation and competence building system - Globelics - research agenda

2 - The need of new theoretical, methodological and analytical frameworks

Information and knowledge have always been important in human history. The notion of ‘Knowledge Economy’ relates to the observation that, since the post-war period, the economy has increasingly relied on knowledge-based activities than ever before. There are at least three usual lines of reasoning for this:
the proportion of labour that handles tangible goods has become smaller than the proportion engaged in the production, distribution and processing of knowledge;

- increasingly the use of complex codified knowledge is a necessary element in giving value to products and services;

- knowledge-intensive activities are rapidly growing and have become the heart of recent economic expansion.

Therefore, and as for instance argued by Soete, 1997, despite the heavy capital investment required for some of the new products, "the physical capital accumulation is no longer the essential “complementary assets” of these set of new technologies. Rather, since the knowledge on how to use information typically depends on one’s skill level and tacit knowledge, the new complementary asset to growth and use of new ICT is investment in human, immaterial capital” (p. 136).

In the core of this process are the new possibilities offered by the development of information and communications technologies (ICT), which have accelerated and deepened both the codification of knowledge and the spread of information. The conversion of different types of codified knowledge and information into digital formats offers the possibility of a minimum dependency on matter, reinforcing the trend towards de-materialization. This trend towards the relative and absolute reduction of material components in the production of goods and services is illustrated, for instance, by the case of software, which can be developed, produced, bought, distributed, consumed and discharged without ever assuming a physical form.

Important in this discussion is to note that the appropriation of physical and intangible resources and goods cannot be placed on equal bases. Knowledge and information are typical cases of non-rival use, since they may be utilized repeatedly and concurrently by many people, without being depleted. Differently from energy and materials, these are resources that are - more than abundant - inexhaustible. Their consumption does not destroy them; and when they are sold, transferred or given, this does not mean that they are lost. On the contrary, knowledge in the shape of know-how and skills grow when used through processes of learning by doing.

Also important to note is the pervasiveness of this processes. In fact, its consequences are not confined to the new high-tech sectors. The increase in the use of knowledge and innovation is radically transforming all economic activities, regardless of their being new or more traditional. Among other things, this reveals the inadequacies of the traditional classification of economic sectors in capturing situations where industries are constantly changing and where market structures are becoming increasingly fluid.

Therefore, the first argument of this paper, that the present transformations of the world economic system – bigger weight of intangibles in the economy, accelerated increase of the knowledge content of activities, goods and services, rapid (and uneven) diffusion of ICT, acceleration of globalization (mainly in its financial dimension) and competition; etc. – are:

- challenging traditional approaches, developed to deal with a different context, to provide sufficient conditions to measure, evaluate and explain the main sources, dynamics and characteristics of the new pattern, as well as its impacts on different economies and societies;

- exposing even more the limitations of orthodox concepts, theories and correlated indicators and statistics systems;

- urging the development of new concepts, theories and instruments.
As argued elsewhere, neo-classical theory has always had difficulties in dealing with technology and knowledge (and with the possibilities of ‘transferring it’) particularly because it assumes that information and knowledge are equivalent commodities. It is also noticeable that the most important contributions to the understanding of the main characteristics of the Knowledge Era and Economy come from heterodox economists, as well as historians, geographers, sociologists, political scientists and engineers.4

This leads to our second argument: the lack of a better understanding of the nature of the present transformations has given space for a number of contradictory interpretations and also mystifications.

3 - Usual myths of the turn of the millennium

The fact that most of the features, orientation and impact of the transformations of the turn of millennium are still very difficult to precise has contributed to form a fertile intellectual environment for misinterpretations and myths, most of them influenced by neo-liberal theses.

Among the most recurrent myths associated with the so-called ‘knowledge era’ and of interest for this paper are:

- a confusion between knowledge and information;
- a supposed natural trend conforming a general process of social, historical, economic and knowledge globalization and homogenization;
- a hypothetical obsolescence of national policies and strategies

Against these suppositions this paper recognizes that (i) with the spread of ICT, equipment and systems - information and codified knowledge can be, more rapidly and easily, produced and diffused throughout the world; (ii) however, non-codified tacit knowledge is only transferred with interactive learning, through social, and often localized, processes embedded in specific environments and organizations. Tacit knowledge is crucial to de-codify information, to make efficient use of these new technologies and to generate new knowledge. Therefore, the need to distinguish the new technologies, equipment and systems, which can be imported, from capabilities (productive and innovative, for instance) that are not easily transferred or acquired.

It is also recognized that the diffusion of the new pattern of accumulation based on information technologies has provided the technical means for people and institutions geographically separated to be connected in real time. Economic contacts of all types have intensified and deepened, as exchanges between actors – individually and collectively – spread all over the world. However, it is pointed out the lack of evidence showing significant changes, either towards de-concentrating the appropriation of revenues, or towards the improvement of international intellectual division of labour.

Instead of globalization, available evidence (i) shows that a significant concentration of trade, production and technology flows in more advanced countries - and particularly those belonging to the so-called Triad – persists; and also (ii) suggests a re-concentration of knowledge and other strategic activities for firms and countries, related to planning and decision-making activities. Far from a real diffusion of knowledge, ‘the global new economy’ reflects the reinforcement of the trend towards ‘privatization’, ‘capitalization’ and ‘commoditization’ of knowledge.5
It is worth emphasizing that most analyses about the globalization process usually do not take into account two big southern regions of the planet - which together congregate more than 60 countries – Latin America and Africa. Contrary to what should be expected about the acceleration of the process of globalization, these two regions are not becoming more integrated into the world economy. The share of these two regions in world trade has been rapidly reduced in the last two decades. In 1996 it represented less than 6% of world trade. Available evidence shows us that.

- about 80% of the world production is still consumed within countries that produce it;
- domestic savings is estimated to finance 95% of capital formation;
- multinational corporations are responsible for two thirds of the international trade, with 40% of the world commerce being realized within these corporations;
- perhaps the most obvious distortion is the increase in the barriers to the mobility of people, particularly low-skilled workers. It is also worth pointing out that even the mobility of specialized professionals is unidirectional, implying further re-concentration.

Therefore the warning that with the new possibilities offered by the increasing diffusion of the ICT, new forms of economic and social polarization (and exclusion) are created. These are linked to digital illiteracy, but also to unequal access to both new products and services and the opportunities to acquire, renew and use knowledge and skills.

Concerned with the social side of globalization, authors, as Freeman (1995), point to the need of designing policies and strategies (i) targeting - not only the access to information and new technologies and equipment - but also the access to knowledge and (ii) to push forward the process of knowledge generation and learning to allow all societies (and the different segments within them) to make use of the information technologies and products available.

In a similar vein, Foray and Lundvall (1996) alert for the risk of threatening the social cohesion of economies if policies promoting information infrastructures neglect the social and distributional dimension, as well to the importance of promoting capabilities and competences (particularly learning capabilities) as central elements in any strategy aiming at limiting the degree of social exclusion. They also pinpoint the risk of IT becoming an acronym for “Intellectual Tribalism” instead of “Information Technology”.

Of course the allusion here is again to the possibility of reinforcing the so-called ‘digital divide’ and the ‘learning divide’. More serious than those is the risk of reinforcing the ‘development divide’. As Arocena and Sutz, 2003, emphasize it is important to take into account, not only the access to the new technologies and the need to learn, but also (and more importantly) the opportunity to apply creatively what has been learnt. In this sense, they argue that educational and other learning policies, even if fundamental, are not enough if people are not allowed to use its creativity and capabilities.

**The present changes do not result from any neutral or natural progressive order**

The simplistic ideas about globalization have also been accompanied by two main policy hypotheses. Firstly, that in the ‘new economy’, economic and technological development was following a supposedly natural, progressive and unequivocal trend. Secondly, that local and national specificities would disappear and the role of policies (in general, and government policies, in particular) would have no relevance.

This paper argues that the upsurge and diffusion of the new techno-economic paradigm and the acceleration of globalization of financial markets result from and reflect political and institutional
changes which have characterized the environment of the most developed countries in the second half of the XX century. These have also oriented a progressing movement towards privatization, liberalization and deregulation of markets and financial systems world-wide supposedly associated to increasing needs of greater competitiveness.\footnote{8}

As a consequence, both a re-concentration of power and an unequal diffusion of the benefits of the changes have been observed at the turn of the century.\footnote{9} Of particular importance in this discussion are the alerts about:

- the trends in the Knowledge Era towards privatizing and to creating scarcity of naturally abundant resources as knowledge and information ‘by legally sanctioned monopolies’ (David and Foray, 2002); and
- the consequences of this process for the consolidation of new forms of geo-politics and further exclusion. (Lastres, Cassiolato and Maciel, 2003).

4 – The Latin American Perspective

We have argued that the main problems facing Brazil and other Latin American countries, at the turn of the millennium, reflect a very poor understanding of the nature and consequences of the present transformations of the world economy. Policies adopted by most Latin American countries reflect these misunderstandings and have led to the downgrading on innovative activities by firms, as well as losses of capacities and to de-learning.\footnote{10}

This paper acknowledges that most of these transformations are still difficult to determine and measure; and that this lack of an adequate framework to capture and deal with the new configurations has fuelled the adoption and diffusion of neo-liberal theses and recipes, sometimes, in very uncritical ways. Globalization is seen as a myth that annuls the search for alternatives and tends to paralyze national initiatives. From a different perspective, we argue that:

- the speeding up of globalization is in many senses a direct effect of de-regulation;
- the main reason for the continuation of the crisis refers precisely to the delay in better understanding of its specificities and in designing appropriate policies to cope with them.

In this effort it is essential to understand that even if some important specific features and trends of this new accumulation pattern are still ‘invisible’ and seem non-controllable, this should not be taken as a permanent obstacle.

Scrutinizing the reasons of the lack of alternative theses, Arocena and Sutz (2003) discusses why ‘Southern frameworks of thought’ developed in the 1950s and 1960s (‘ECLA structuralism’ and ‘dependency theory’) have not been replaced by a new holistic view, noting that ‘perhaps, as hegemonic thinking would claim, because there is no need for ‘regional’ frameworks of thought any more. Alternatively, it is possible to claim that they are indeed needed but that hegemonic thinking makes it very difficult to build them’. One of their main arguments is that, despite the difficulties, a ‘Southern framework of thought’ is fundamental to the analysis of development problems related to knowledge, innovation and learning.

The point here is not to deny the value and contribution of theories and concepts that were developed in the North through the observation and analysis of processes occurring in the developed world. It is quite the opposite. It is recognized that such ideas are relevant for the analysis of the developing world. However, one should note that development cannot be understood
as if the economic history of all countries follows a common “development path”, each country at its time and with different speeds.

The economies of developed countries are not defined exclusively by their internal structures and processes or by qualitative or quantitative factors, but also and mostly by their dominating position in the world system. In this sense, a “Southern” framework of thought could benefit from incorporating some of the premises of the Latin American underdevelopment theory; and in particular the idea that the evolution of a national (or regional) economic system depends, to a large extent, on its place in the hierarchy and power structure of the world capitalist system.

All this points to the need for (i) developing new conceptual, methodological and analytical frameworks to deal with the new pattern and to (ii) designing and implementing more sophisticated forms of promoting industrial and technological development, taking into account the present transformations, local and national conditions for development and also the changes associated with international context of financial globalization and the new forms of governance at world level.11

It is worth mentioning that it is not by chance that the concept of national (sub and supra-national) system of innovation was developed in the 1980s as a response to the spread of the idea of a new global economy and society. One main objective was to deny the hypothesis that in the “new economy”, local and national attributes would disappear and the role of policies (in general, and government policies, in particular) would have no relevance.

It is also important to stress that national and local conditions may lead to completely different paths and to a growing diversity instead of the standardization and convergence suggested by the more radical theses about the influence of globalization on national and sub-national systems. As emphasized, for instance, by Celso Furtado, ‘globalization is very far from conducting to the adoption of uniform policies. The mirage of a world behaving under the same rules dictated by a super IMF exists only in the imagination of some people. The disparities among economies are due not only to economic factors but, most importantly to diversity in cultural matrices and historical particularities’ (1998:74).

Finally, we would stress that the effort required to understand the new conditions for mobilizing development and growth will certainly benefit from different contributions and approaches; particularly those capable of freeing themselves from the limits imposed by theories, concepts and indicators developed to understand a completely different phase of economic accumulation and pattern of development.

5 - The usefulness of the concept of system of innovation - SI

The interest that the concept of SI has attracted relates mainly to the belief that it represents a promising analytical tool for better understanding innovation processes, as well as processes of creation, use and diffusion of knowledge.12 It is important to stress that underlying the system of innovation approach is a:

- resurgence of the interest in historical and national trajectories and in technical change;
- characterization of innovation and learning in a broader context and as interactive processes with multiple sources;
- stress on the importance of and complementarity between incremental and radical, technical and organizational innovations and their different internal and external sources;
- re-conceptualization of the firm as a learning organization embedded within a broader and specific socio-economic-political environment reflecting historical and cultural trajectories;
- focus on the localized (and national) nature of the generation, assimilation and diffusion of innovation, as opposed to the simplistic idea of a supposed techno-globalism;
- observance of the systemic nature of innovation and the importance of taking into account the productive, financial, social, institutional and political spheres, as well as micro, meso and macro dimensions.

These features of the concept, which help understanding the dynamics of the innovation process as well as guiding policies its promotion in any countries, are more developed in Lastres, Cassiolato and Maciel, 2003. Here, we highlight those that are of particular relevance for the less developed countries and regions perspective.

**A new understanding of the role and characteristics of innovation**

It is important to emphasize that the innovation system approach breaks ranks with the traditional view of innovation as a process of radical change at the scientific and technological frontier and recognizes that innovation extends beyond formal research and development (R&D).

The recognition that innovation extends beyond formal R&D activities, in its turn, emphasizes the importance of also taking into account: continuous improvement in product design and quality, changes in organization and management routines, creativity in marketing and modifications to production processes that reduce costs, increase efficiency and ensure environmental sustainability. In this line, Mytelka and Farinelli, 2003, propose that innovation should then be understood as ‘... the process by which firms master and implement the design and production of goods and services that are new to them, irrespective of whether or not they are new to their competitors — domestic or foreign.’

This understanding, as they stress, helps to avoid an overemphasis on R&D in the innovation process, encouraging policy-makers to take a broader perspective on the opportunities for learning and innovation in SME and in the so-called traditional industries. Such a definition - that Mytelka has introduced in previous works - is particularly important for the analysis of innovation in less developed countries, and that is one of the reasons why the approach of system of innovation and this broader concept of innovation orients the research agenda of RedeSist.\(^{13}\)

**Importance of social, political and institutional contexts**

By emphasizing particular historical, political and national trajectories, the system of innovation approach also takes into account the different geopolitical context of the different national systems. A country’s (or region’s) innovative capacity is understood as deriving from the relations among its social actors, movements, organizations and institutions. And this capacity is its ability to make the most adequate choices, and in applying the results of those choices where they will be most productive, socially and economically. Historically defined cultural and institutional conditions are crucial in determining those choices. It is in this sense that the national system of innovation approach reinforces the thesis that generation of innovation is localized and bound to national and regional frontiers, contrasting with the idea of a supposed techno-globalism. Since a significant portion of knowledge on which the innovation process is based is tacit, cumulative and localized, endogenous technological capabilities are required to the efficient absorption of knowledge, in order to adapt, modify and, then, generate, new knowledge.

Johnson and Lundvall, 2003, suggest that social capital, together with learning processes, are the key to development strategies. They argue that ‘social capital is a set of mostly informal institutions
(social habits and norms), which affect the levels of trust, interacting and learning in a social system and cannot be accumulated in a straightforward way’. This point reinforces the argument that there is not one unique ‘model’ to be imperatively followed, and that no culture has a monopoly on the factors for successful socio-economic development. Each case must be studied according to its peculiarities, its specific characteristics, and the international context – with its limitations and opportunities – in order to evaluate what should be its own, specific, strategies and mode of development. These are some of the reasons why the use of concepts and parameters such as “bench marks” and “best practices” have been criticized.

**Micro-macro relationship**

Another important advantage of the national system of innovation - NSI - approach is that it allows taking into consideration its micro, meso and macro dimensions. Freeman, 2003, for instance, emphasizes the importance of considering all these dimensions, as well as their linkages. He shows that the frailties of the so-called new economy – which are not usually discussed precisely due to the missing link between micro and macro on the analytical level – point to the mistake of considering that an entire economic system can stand on a single set of technologies (in this case, ICT). By not considering the complexity of the entire array of social, economic and political structures, which underlie them, calling for an equally complex and multidisciplinary treatment, the approach of mainstream economics cannot perceive the real sense – as meaning and as direction – of the new developments.

Similarly, Coutinho, 2003, criticizes neo-classical theories, which reduce the macro dimension to a mere sum of the microeconomic short run outcomes and adds that ‘the specific characteristics of macroeconomic systems contain and condition the microeconomic decisions that form the standards of financing, corporate governance, international trade, competition and technical change.’ Coutinho discusses the influence of the micro, meso and macroeconomic dimensions and relationships on firms’ behaviour regarding especially their investment in productive and innovative capacities. Focusing on the Brazilian case, he discusses the specificities of the macroeconomic context of the 1990s resulting from the acceleration of financial globalization; as well as how this new context imposes even more serious limits on development and innovation policies.

**6 - Systems of innovation and developing countries**

The systems of innovation approach has been criticized for the absence of formalization. However, it could be argued that the development of this approach did not intend to create a theory in itself but rather to provide a useful framework for analyzing innovation dynamics. Additionally, it does not put innovation and learning processes into a strait-jacket model developed according to the specific experience of one (or a few) advanced countries, which could hardly be reproduced even in other economies in the North, not to mention the South. Therefore, what is seen by some as a disadvantage is here considered as the main element in providing a flexible and useful conceptual, methodological and analytical framework.

This acknowledgement does not deny the importance of elements of economic theory that help the analysis of innovation systems. Also, one important effort for setting up concepts, methodologies and indicators to deal with the processes of knowledge generation, acquisition and diffusion is the development of new models and quantitative tools adequate to system of innovation approach. Of special interest is it to develop models on how small events combined with increasing returns result in virtuous and vicious circles as well as in lock-in situations. Models of communication and networking are also helpful in getting a better understanding of how processes of interactive learning and diffusion take place.
From the specific point of view of less developed countries (LDCs) the usefulness of this approach resides precisely in the fact that its central building blocks – broader understanding of innovation; diversity of social, economic and political agents and contexts; systemic approach, observance of micro, meso and macro relationships, etc. – allow for their specificities to be taken into account. Of particular relevance is the emphasis on the importance of innovation for the sustainable competitiveness of these countries and not traditional advantages such as low labour cost and natural resources, which Fajnzylber (1988) called ‘spurious competitiveness’.

Furthermore, understanding innovation as a localized, context specific and socially determined process allows the demystifying of ideas about the possibilities of generating, acquiring and diffusing technologies in less developed countries. It makes clear, for instance, that acquisition of technology abroad is not a substitute for local efforts. On the contrary, one needs a lot of knowledge to be able to interpret information, select, buy (or copy), transform and internalize technology. Actually, it seems at least naïve to think that any firm would be willing to ‘transfer’ (or to share) precisely the main strategic competitive asset of the knowledge era. In this sense, ideas that technology is becoming a global commodity run totally against the trends observed nowadays, with the pressures to privatize and control knowledge, as discussed above.

As pointed out by a number of Latin American and Caribbean authors, also of significant importance is to take into account the problems related to the instability and vulnerability of the macroeconomic, political, institutional and financial environments, which have been a marked characteristic of less developed countries. Additionally, some of them have pointed to problems such as hyperinflation, high external debt and high interest rates as common important constraints to technological (and productive) development in these countries. One main argument here is that macroeconomic contexts in developing countries are of much greater importance than specific innovation policies. That is why they may be called ‘implicit’ technology policies.

Coutinho, 2003 - discussing the specificities of the 1980s and 1990s macroeconomic contexts in Latin American countries - shows how interest rates and exchange rate policies impact directly on the core of the microeconomic business calculus, that is, on the essence of capital management. He also argues that economies that are subject to high rates of interest place additional penalties on companies operating within them and emphasizes that ‘if in addition to high levels of basic interest rates, the economy in question is classified as a country with high exchange rate risk (“Country Risk”) its business sector is penalized even more heavily’. The point is that, under a more globalized regime, the freedom to maneuver in determining interest rate/exchange rate policy depends even more on the foreign exchange position of the economies, both in terms of stocks (position as a creditor/debtor nation) in terms of flows (surplus/deficit) in the current account.

As a consequence, to cope well with ‘financial globalization’ Coutinho, 2003, recommends developing the means to avoid depending too much on it. His argument is that those countries with a more developed national innovation system will find themselves in a better position if they are in equilibrium or have a surplus in their balance of payments (as well as foreign exchange reserves), since they can grow faster with lower interest rates and reduced country risk-rate. In an opposite direction, countries with a less developed national innovation system will be in persistent disequilibrium in their current account, without a sustainable level of reserves, penalized by high risk-rates and needing to maintain high real interest rates. The result is macroeconomic vulnerability, which has been the case not only for Latin American countries in the last two decades.

7 – Systems of innovation in Brazil and South America: experience of RedeSist
In 1997, a research network – RedeSist – was set up in Brazil aiming basically at investigating and understanding local processes of learning and capability accumulation. The systems of innovation framework was used in the analysis of *local productive systems and arrangements* (LPSA). The LPSA concept was developed by RedeSist in order to deal with methodological questions in this large research project.

Following the idea that innovation processes occur in a cognitive space and that productive and innovative capabilities are also affected by the pattern of specialization and competition, we emphasize two interconnected dimensions essential to understand these processes: the territory and its socio-political economy. Our aim was to target all the systemic aspects that affect competitiveness particularly inter and intra-industry social, economic and technological relationships. This goes beyond the traditional sectoral view since it includes all possible industries that interact – in real or potential terms – in this particular cognitive space. Our approach does not intend to cover neither one sector as a whole, nor it is confined by the boundaries of one particular sector.

In this sense, we define a *local productive system* as any productive agglomeration involving economic, political and social agents localized in the same area, performing related economic activities and presenting consistent articulation, interaction, co-operation and learning processes. It includes not only firms (producers of final goods and services, suppliers of inputs and equipment, service providers, etc.) and their different forms of representation and association, but also other public and private institutions and organizations specialized in educating and training human resources, R&D, engineering, promotion, financing, etc.

We have also developed the concept of *local productive arrangements* to include productive agglomerations, in which there is no (or almost no) articulation among the agents.

Based on this concept a compatible empirical methodology to gather information about the strengths and vulnerabilities of Brazilian productive, innovative and learning processes was developed. This methodological framework covers micro, meso and macro elements influencing the evolution of the arrangements. The methodology chosen was to approach the theme through the analysis of productive and innovative capability of selected local systems; the competence structure, institutions, relations and incentives which are more appropriate for mobilizing local innovative potentialities.

Also on the agenda was how transformations that occurred in the 90s have affected the evolution trajectory of local systems, particularly in what refers to their capacity to generate, absorb and diffuse innovations. Up to 26 case studies in different regions of Brazil, Argentina and Uruguay were produced covering industries such as aerospace, biotechnology, automobile, textiles-clothing, wine and leather-footwear.

The case-studies aim mainly at:

- characterizing the local productive arrangements, their histories, main economic activities, products and services, firms, other public and private organizations, institutions and coordination structure;
- discussing the conditions under which local learning, the accumulation of productive and innovation capabilities and effective use of these capacities occur;
- determining in what sense the type of governance, competition pattern and market structure – local, national and international – influence the evolution of the arrangement;
investigating to what degree the competitiveness of the arrangement is sustainable and dynamic regarding embeddedness, articulation with the local system of innovation and main competitive elements (product quality, value-added, productivity and labour);

examining the influence of the macro-economic regime of the 1990s and of local and national, explicit and implicit policies on the evolution of the arrangements.

Advantages of the focus on Local Productive and Innovative Systems and Arrangements

Among the main advantages of the focus on Local Productive and Innovative Systems and Arrangements - LPISA - developed by RedeSist, we would pinpoint that it:

- represents a practical unit of investigation that goes beyond the sectoral or individual organization approach allowing for establishing a bridge between territory and economic activities;
- targets the group of different agents (firms and organizations dealing with education, training, R&D, promotion, financing, etc.) and connected economic activities that usually characterize any productive and innovative local system;
- symbolizes one real locus and covers, at that level, the whole space where learning takes place, productive and innovative capacities are created and where tacit knowledge flows;
- represents one major locus where policies to promote learning, innovation and competence building can be more effective, by allowing the definition of specific policies and instruments. In this case we would stress the relevance of the participation of local agents and to deal with collective actors, as well as importance of national coherence and coordination.

8 - Suggested lines of investigation to Globelics’ research agenda

Taking into consideration the background papers and the discussion that took place during the Globelics First International Workshop and also given the experience accumulated by RedeSist, we would suggest the following lines of investigation to the Globelics’ research agenda:

- mapping efforts developed in different parts of the world
- developing ways of identifying, measuring and analysing processes of creation, acquisition, use and diffusion of knowledge
- research on the advantages of the focus on learning, innovation and competence building systems - LICS
- development of practical tools and models to analyse the dynamics of LICS - concepts, methodologies, etc.
- studies on national, supra and sub-national LICS
- role of nation states in promoting economic development and systems of innovation in different historical and geopolitical contexts
- identification of main elements of the dynamics of LICS - characteristics, actors, governance, social capital, interactions and cooperation
- comparative analyses of LICSs
- studies on how LICSs are affected by the acceleration of globalization and financiarization of the economy, specific macroeconomic conditions, etc.
- perspectives of the evolution and diffusion of the characteristics of the knowledge learning economy and consequences on different LICSs
- identification and evaluation of policies and instruments already available to mobilize and promote LICSs
- new policies and instruments to promote LICSs and development
- glossary of main terms and concepts relating to LICSs
- the impact of the widened use of information systems on LICSs

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5 For details see for instance, Freeman, 2003 and Johnson and Lundvall, 2003.
6 Lastres and Albagli, 1999.
7 For a discussion on the perspectives of an increase in the process of brain drain even among the most advanced countries, see for instance, Petit, 2003.
8 Humbert, 2003, recalls the slogan ‘join the global train immediately or you’re finished!’ and discusses the reactions it has provoked, pointing out that the neo-liberal promotion of globalization represented itself ‘a clear call for dismantling all barriers so that the nation-state territorial production apparatus of any country becomes open to any actors of the global system’.
12 See Lundvall, 1992; Freeman, 1995a; Edquist, 1997 and 2002; Lundvall et al., 2002.
13 For details see www.ie.ufrj.br/redesist. It is worth pointing out that the recognition of these advantages does not impede us from appreciating the alerts made by Chesnais and Sauviat, 2003, about the links of the global finance dominate regime and this broader concept of innovation and innovation-related investments - which stresses mainly ‘the marketing of new (or apparently new) products’ – as well as the possible consequences to long-term education and R&D investment, and particularly on the fundamental research base.
18 For details of this methodology, including the three types of questionnaires developed to base the field-work, see www.ie.ufrj.br/redesist. The results of the work developed by the research network are also available there.
19 Aalborg, 4-5 November 2002, see http://www.business.auc.dk/ike/ike-attach/Globelics.htm