

Innovation and Democratization of Knowledge as a Contribution to Inclusive Development

(Chapter 1 of the book *National Innovation Systems, Social Inclusion and Development*, edited by Gabriela Dutrénit and Judith Sutz, Edward Elgar, 2014, 15-34.)

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Knowledge-based inequality prevails in the contemporary world.

Charles Tilly (2005: 123)

Abstract

In the global society that capitalism has conformed, advanced knowledge constitutes the fundamental infrastructure of the whole set of power relations; the most gravitational and destabilizing production dynamics have technological innovation as their main motor; financial capital makes its harsh domain known. These three interconnected processes have a profound impact on who wins and who loses from economic growth and globalization, concerning the distribution of benefits and damages that comes with the expansion of science, and the possibilities for handling environmental problems.

Therefore, the *democratization of knowledge* represents one of the inescapable requirements for development, understood as the improvement of the material and spiritual quality of life of people, seen as agents and not as patients, as stated by Amartya Sen (2000).

This justifies the need to rethink the issue of development combining: (i) a normative approach based essentially on Sen's premises; (ii) a theoretical-factual approach where the structural character of inequality in the capitalist knowledge society is taken into account; (iii) a prospective approach, which explores trends and characterizes the perspectives of advancing towards the normative horizon in the midst of the restrictions and potentialities marked by

the factual approach, and finally (iv) a propositional approach, whose main axis is the democratization of knowledge, an indispensable requirement for inclusive development.

Although analytically separate, these four approaches are interrelated and mutually condition each other. Innovation policies are the result not only of the propositional approach, but also of the other three, although these are often barely explicit. But when the intention is to show the need of a change in paradigm -as well as to analyze its viability- regarding innovation policies to allow them to contribute directly towards inclusive development, we need to address the issue from the whole set of approaches.

Foreword: Inclusive Development and Knowledge

For discussion and action to take place, a certain level of basic agreement is required. Regarding development, this basic agreement, in its most stylized expression, is formulated as a description and as a prescription: great disparity is observed in average living conditions between different regions of the world, and it is postulated that we should try to change the situation, especially regarding the most underprivileged human beings. In this way, we can advance towards a synthetic concept: “Human development is the expansion of people’s freedoms and capabilities to lead lives that they value and have reason to value.” (PNUD, 2011: 1)

This conceptualization was presented more extensively in the first Human Development Report in 1990: “Human development is an expansion process of the opportunities of human beings, among which the three most essential are to enjoy a long and healthy life, acquire knowledge and achieve a decent standard of living. Other opportunities include political freedom, the guarantee of human rights, self-respect, and what Adam Smith called the capacity to interact with others without ‘feeling ashamed to be in public’.” (PNUD, 2010: 12) This more extensive characterization is less satisfactory than the one previously expounded, for more than one reason; for example, is worth the “guarantee of human rights” less essential than “acquiring knowledge”? Therefore, we prefer

to work based on the synthetic concept of *human development* originated by Sen (1999) and mentioned at the end of the preceding paragraph.

This notwithstanding, the most extensive characterization collaborates with the specification of the notion of development. For example, when highlighting the opportunities of “enjoying a long and healthy life” and “achieving a decent standard of living”, it reminds, justifiably, that the notion of development rose in relation to the expansion of the production of goods and services, which must be considered in quantitative and qualitative terms. It therefore includes *productive development*, characterized by the combination of increase in production and technological innovation.

But the expansion of production has put the environmental sustainability of life on planet Earth in question. This is why the notion of *sustainable development* was created, understood as the set of processes which allow us to fulfill the needs of current generations without damaging the possibilities of future generations to fulfill their own. The sustainability of development also depends on an inverse relationship between the present and the future: it concerns building today the skills and conditions which will enable the promotion of development tomorrow. It is therefore worth thinking in terms of (*self*) *sustainable development*, where self-sustainability is related to the environment, with the knowledge required to face the many problems affecting human beings and with social conditions.

The exclusion lived today by so many people, at such levels that an elaborate definition of the notion is not required to appreciate it, increasingly prevents them from “leading the kind of life they value and have reasons to value”.

Therefore, human development must by nature reject exclusion and embrace *inclusive development*. “Inclusive development is a process of structural change, which gives voice and power to the concerns and aspirations of otherwise excluded groups. It redistributes the incomes generated in both the formal and informal sectors in favor of these groups and it allows them to shape the future of society in interaction with other stakeholder groups.” (Globelics Thematic Report 2012, 10)

Recommendations for action always presuppose a given interpretation of reality, a certain way of looking at it. The sequel proposes a point of view which centers attention on the relationships between knowledge and (in)equality.

1.- Approach to the issue of development and underdevelopment

End of development as a “place”

In earlier times, “development” designated a “place” as much as a “way”. As a place or a set in a classification of countries, it was occupied by the so-called “developed” countries. As a way or a path, it was the one transited (or which had to be transited) by other countries, frequently referred to as “developing”. The latter, by definition, were not developed; this meant they conformed a disjoint set with that of the developed countries. The duality of meanings was justified because it was assumed that the “path” to development led to the “place” or “level” of development.

Discussions took place over which was the path that really led to the desired place, how to characterize the place of development, and which countries truly occupied it. But the prevalent positions had important traits in common: they all believed they knew the paths, they all considered that these paths passed through economic growth and industrialization; all offered concrete examples of countries which, having taken the recommended paths, already arrived at the place of development, where certain great problems were definitively solved. The latter did not imply entering a stationary state: “developed” countries were still confronting challenges and experiencing changes, but it was considered that their changes were not part of what was called the development process; such changes took place without losing the main achievements obtained along the way, that is, without exiting development as a place. In short, development constituted a viable path for the purpose of reaching a desirable and stable place.

The double concept of development, representing a place and a path simultaneously, still has wide support, especially implicitly, but in reality it has

lost validity. We will attempt to justify this last affirmation and highlight some of its consequences, considering as a basis the Human Development Report of 2011, titled: "Sustainability and Equity: "A Better Future for All" (PNUD 2011). The title itself implies a prescription for action, while the description of the situation can be presented through the following synthesis of the message mentioned in the Report.

Box I

Some problems of sustainability and equity in face of the future

- (i) the world is facing a generalized environmental degradation, including a possible disaster scenario
- (ii) environmental degradation is associated with economic growth, which is required in order to eliminate poverty, presenting an immense dilemma
- (iii) in many regions inequality, especially income inequality, grows with economic growth, resulting in an even greater challenge
- (iv) inequality is reflected in the damages that follows environmental degradation, for example, because "indoor pollution kills 11 times more inhabitants of countries with low HDI than those in other countries" (p. 7)
- (v) the inequality of situations comes from the inequality of power (p. 9).

Source: PNUD, 2011. Own elaboration

The assertion that economic growth is necessary but not sufficient for development fostered the creation of the notion of "human development", and more specifically, the Human Development Index, which combines the GDP with data related to health and education. Should development as a "place" be restricted to those countries with high or very high Human Development Indexes? It is difficult to consider several of them as "developed", in terms of an expression of value.

The preceding Box reminds us of another strong assertion that has gained wide support in the last decades, stating that economic growth promotes generalized environmental degradation that makes a global disaster possible. Should development as a place be restricted to countries that have ensured their

sustainable human development? This would represent a relatively small place, or simply an empty set, if we confirm the scenario of global environmental deterioration.

Development as a place defined an aim that was both feasible and desirable: its feasibility was plainly established by the fact that a significant group of countries had reached it; its desirability lay in the fact that advancing towards it entailed in itself a considerable improvement in terms of quality of life. When the “really existing” experience of development is mostly associated not only with environmental deterioration, but also with an increase in inequality, this must act at the very least, as a warning sign.

Today, China is the dominant example in terms of development as a path. Its impressive capitalist expansion eloquently illustrates the problems mentioned in Box 1. It has helped hundreds of millions of people to overcome misery; it probably exemplifies, on an incomparable scale, the specifically modern phenomenon of political regimes whose legitimacy among a large part of their population is based on economic growth. However, the environmental degradation (Ferguson, 2011: 293) and social inequality that accompany the economic expansion of the “Middle Kingdom” are impossible to hide. If “sustainability and equality” are required components in the construction of a “better future for all”, then the viability of the latter in China is questionable. Is it possible to confidently assume that the chosen path there leads to a desirable and stable place?

The United States continues to have a major presence in development as a place ever since the issue of development broke through the foreground. Even before, the aspiration and reality of massive consume put this country at the peak of global attention. It is worth posing the question if the United States define such a desirable “place” in terms of environmental sustainability, social equity and spiritual quality of life, to incarnate the goal of the “path”.

But a more basic issue takes precedence in what concerns us. It was taken as given that in the case of development as a “place”, it would never be necessary to erect a sign at the location saying "no vacancies". Now, if the United States is the perfect example of development as a place, and China of development as a

way or path, this understanding has expired. If the entire world achieves what the United States is today and what China is on its way to becoming, in terms of consumerism and environmental impact, the future will not be better for everyone, and will not even constitute a place where sustainability is a possibility.

Is there anywhere in the world in which the expansion of capabilities and the freedoms to live lives one has motives to consider valuable are consolidated? This is the central part of Sen's notion; to assume it implies recognizing the expiration of the conceptualization of development as a truly existent place in our world.

This highlights aspects of the problems of development previously considered to have been mostly resolved: the adoption of a determined characterization of development as a "place" implied the adoption of ethical, theoretical and prospective definitions. The "place" had a series of fundamental traits, related to the living standards and the forms of social organization that constitute the normative aims of development as a "path" or process. This "place" aimed at was viable, and furthermore, in several conceptualizations there is where history was headed: this was a central affirmation in prospective terms. Such affirmation arose in empirical terms (the "place" was exemplified by truly existing places) as well as interpretative terms (this "place" was a necessary stage in light of a certain concept of social evolution); this constituted the axis of the approach to the development issue in theoretical-factual (or descriptive and explanatory) terms.

If the normative, theoretical-factual and prospective issues seemed mostly resolved, it was natural to concentrate the attention on the propositional aspects: what to do? This is why the center of discussion revolved around the paths, the strategies and the policies for development.

Once the "place" of development had been characterized, it was also natural to center attention on the economy: looking from this "place" at those countries that were still not there, one of the notorious differences was related to the resources available for the fulfillment of collective needs, which led to prioritizing the multiplication of production capacities. During this process, many

challenged this view, among which Gandhi was probably the most famous of a long list. But Gandhi rejected the idea of taking India to a "place" that included industrialization among its defining traits, as was the aspiration of the politically and academically predominant conceptualizations. For them, tracing the maps for "the path" was perceived above all as the task of economic development theory.

A rich self-critical review of this approach was presented under the eloquent title: "Essays in Trespassing. Economics to Politics and Beyond" (Hirschman, 1981). This "beyond" without doubt includes values. These constitute the starting point of Sen's conceptualization of development as an expansion of freedoms. Hirschman and Sen suggest not only revising the maps, but also questioning the type of maps we need to trace. On our part, we suggest that for this purpose we need to combine normative, factual (or better still, theoretical-factual), prospective and propositional approaches, with an understanding that these must not be independent, but that none should be contained in any other or directly deduced from the rest.

Proposals should be inspired in values and be translated into practical terms, for which they must consider the limitations and possibilities drawn from the appreciation of facts and their supposed evolution. The combination of normative, theoretical-factual and prospective approaches suggests a propositional approach of a certain type, but it does not determine it, and it never provide recipes but just guides for action, which may eventually be useful if they are accompanied by flexibility, talent and luck for practical work. The autonomy of the latter cannot be forgotten by theory, though, without falling into the sin of hubris.

What happened to underdevelopment?

The issue providing the title to this section arises naturally from the "paradigm change" assumed in passing from the concept of development as a "place", exemplified by the reality of certain countries, to the conceptualization inspired by Sen.

Within the first paradigm, for orthodox schools underdevelopment simply doesn't exist; there are "backward" countries, a term less kind than "developing countries", but more expressive of the conceptualization which inspires it.

Taking that view, the extent to which these countries are more or less lagging behind puts them lower or higher on the steps of the development ladder, without having completed their climb.

Always within this first paradigm, the notion of underdevelopment is characteristic of certain heterodox schools, especially the classical Latin American conceptualization of development, moulded on "ECLAC's structuralism". For this viewpoint underdeveloped countries are those who see their path to development blocked by the prevailing power relations at a global level, as manifested in the "international division of labor", designed in benefit of developed countries that occupy the "centers" of the system and relegate others to peripheral positions.

Sen's conceptualization gives little attention to the subject of underdevelopment. But it is a notion to be reviewed and updated, because it reveals the deepest and more long lasting "objective" obstacles for the expansion of capabilities and freedoms. Within the framework of the "new" paradigm, the factual approach must rescue the notion of underdevelopment elaborated by heterodox variations of the "old" paradigm, starting from the differences in power inherent in a system made up of centers and peripheries, which generate relationships of dependence on the part of the second towards the first.

In the mid-twentieth century, the world was divided between a small group of wealthy countries and the rest, experiencing various levels of poverty; the peripheral countries specialization in the production of primary goods was often induced by various factors, including forced deindustrialization. (Rodrik, 2011: 136, 141.) When the center-periphery system was configured, a second wave of industrialization had already gained force in the West which main vector was "the wedding of science and technology". This favored the expansion of skills and even freedoms in the central countries, but not so in the majority of peripheral regions

The “centers” became specialized, rather than in industrial production, in the expansion of their “comparative advantages” in order to diversify the production of goods and services of high and rising complexity. An economic school of thought with old ancestors sustained that this is the path to wealth, whereas the comparative advantages of a not very diversified and low complexity production trace a path towards continued poverty (Reinert, 2007).

The majority of the periphery changed progressively and even became industrialized, without truly abandoning this type of specialization of goods and services that requires relatively little knowledge. Such specialization tends to increase disadvantages at an international level, in terms of economic, political, military and even ideological power; inversely, asymmetries of power tend to maintain the peripheral condition. We can characterize underdevelopment as a combination of the peripheral condition, expressed in the specialization of activities with relatively little knowledge content, together with external subordination. Underdeveloped countries therefore experience an interconnected set of major obstacles for (i) overcoming external disadvantages regarding living conditions, and (ii) improving the internal situation of the most disadvantaged people. Underdevelopment is therefore an objective phenomenon which constitutes at the same time a principal obstacle for the creation of capabilities and an environment little suited for the expansion of freedoms.

2.- The difficult compatibility between the normative approach and the prospective approach

What prompts people to work towards overcoming underdevelopment? In the founding theories, development had history itself as a motor, marching either from tradition towards modernity or towards the following stage of social evolution, eventually by way of revolution. One way or another, it exemplified the “mega stories” that today seem to be obliterated. Development as a

proposal can only live or be revived in forms where special attention is paid to motivations.

A formula “without complications” may assume the generalized aspiration to multiply access to goods and services as a motor for development. Instead of the trespassing of borders suggested by Hirschman in the search for wider approaches that would be more satisfactory, the option would be to proceed in an inverse manner, focusing attention on economic growth. Considering the facts, this appears to be the prevailing alternative. It has in its favor the advantage of simplicity –at least relatively speaking- both in terms of the doctrine and of “policies”, which is not little advantage when the complexity seems unmanageable. It may also be argued that that is what many people actually want, especially those who have less, thus ending the discussion around the normative aspect. The capacity to promote economic growth tends to be a powerful factor for legitimizing a political regime in the view of a large part of its population.

It has been sustained (Ferguson, 2011) that massive consumerism, as well as the capacity to promote and enable it has been one of the keys to the predominance of the West over the Rest, now reaching its end precisely because this aspect has ceased to be monopolized by those who first put it to work. Economic growth and massive consumerism have multiplied together to the point that, in their present form, this combination does not appear to be sustainable, either in environmental, social or ethical terms.

The social problematic associated with economic growth is linked particularly to the reiterated proof that this will not in itself generate a "trickle-down effect" of benefits towards disadvantaged sectors; in a large part of the world, inequality increases with economic growth. A scenario of rising inequality may become, particularly through violence and degradation of the life in common, unfavorable to the continued expansion of the possibilities for production and consumption. The ethical problematic is related to prevailing values that prioritize individual interests under forms that are little compatible with wider concerns (Singer, 1993). This augments the mercantile aspect of social relationships, erodes cooperation (Heyer et al, 2002), does not promote more austere forms of

consumerism and is generally not very compatible with collective efforts to limit the degradation of the environment and of shared life. In this sense, it seems that the dominating tendencies lack ethical sustainability.

In short, the normative foundations of development, from a perspective that is compatible with the motto of **Sustainability and equality: a better future for all**, run against the predominant current. In this sense, Sen's concept has clear critical content derived from its own starting point. Desired results do not necessarily have significant possibilities of being viable. When good intentions are translated into a long list of recommendations with generally doubtful viability, in the best of cases they manifest angelic traits. The normative approach has to be the starting point for action; but in order to have real propositional value, it has to be situated within what is permitted by facts and what possibilities do not ban. In factual terms, underdevelopment and inequality appear as major obstacles to the expansion of capabilities and freedoms.

In prospective terms, the “trend scenario” does not portray “a better future for all”, but instead a much more nuanced situation, because it includes a strong push towards increase in production and consumption, as well as the primacy of individual interests, inequality and environmental degradation. It is worth mentioning here that the “trend scenario” –the one that would materialize in the future if present dominant trends persist as such- is not necessarily equivalent to the “most likely scenario”. In case of a high probability that some predominant tendencies generate consequences that erode the whole set of activities, the differences between both scenarios may become apparent.

The normative approach and the trend scenario have colliding trajectories. A well-structured propositional approach vertebrated around the expansions of capabilities and freedoms must emphasize cooperation, concurring with Sen's emphasis on agency.

This in turn leads us back to the theoretical-factual approach, as it requires paying special attention to the motivations and interests sustaining this propositional approach. The later must enable activity which will gradually expand its ethical support, strengthening the dispositions to perform as agents

in processes with individual and collective as well as private and public dimensions.

Hirschman (1982) has thoroughly studied the “shifting involvements” between the public and the private. Related to this, he employs a thought-provoking metaphor stemming from the fundamental affirmation of the United States Declaration of Independence, according to which it is a self-evident truth that human beings are created equal and have certain inalienable rights; to life, liberty, and the pursuit of happiness. One right as important as this last one, or which can be, is its inverse statement: the happiness of pursuit (Hirschman 1999), understood as involvements in various activities that contribute to the improvement of the quality of life and are gratifying in themselves. For there to be enough people involved in the search for the good of others, and therefore the construction of a better future for all, it seems necessary that this search should in itself imply in the present an improvement of the quality of spiritual life. The propositional approach has to pay special attention to the construction of happiness of pursuit.

We conclude this section with an attempt at synthesis:

Box II

Over stylized synthesis of the conceptualization of development from Sen’s proposal standpoint

- (i)** development is defined in ethical terms, characterizing it as the expansion of capabilities and freedoms, both individual and collective, in order to live in ways people has motives to consider valuable. This
- (ii)** constitutes both the defining aim of development as its main tool, especially to face the major obstacles of underdevelopment and inequality, and implies
- (iii)** treating people not as patients but as agents, capable of participating in diverse forms on the pursuit of happiness, cooperating, and finding happiness in the pursuit.

3.- The theoretical-factual approach: Globalization induced by the capitalist knowledge society

Outline of the conceptual framework

The expansion of capabilities and freedoms is conditioned by interactions between people and with nature. We attempt to consider both aspects, as well as their mutual connections. With this aim, the conceptual framework we are using starts from an observation by Daniel Bell (1999: xxix-xxx) concerning Marx's conceptualization, which calls to pay special attention to production forces (or technology) as well as to the social relations of production, but asks to "de-coupling" them, in the sense of not assuming that a given situation of the former will necessarily correspond to one and only one situation or state of the later; but instead, to consider the interaction between both dimensions, admitting that there can be different combinations. As recorded during a large part of the 20th century, societies with similar fundamental technological bases (industry) can have very different production relations, of capitalist or statist types.

Regarding social relations, it is not rich enough to consider only those of economic type, but at least we should include in the analysis what Mann (1986, 1993) denominate the four sources of social power: economic, political, military and ideological relations. The need for human beings to define the ultimate goals of life, of sharing norms and values, and to participate in aesthetic and ritual practices, generate networks and organizations of ideological power. The need to extract, transform, distribute and consume resources from nature generates economic power relations. The convenience of organizing the use of physical force, for the defense of human groups or the advantages provided by aggression, generates military power. The usefulness of regulating relationships between people in a centralized manner within a defined territorial scope gives way to political power, implying state power. (Mann, 1993: 7-9)

In Mann's theory, the relative relevance of these "sources of social power" is directly related to the organizational power they can express under certain circumstances. Each of these sources gives way to power networks (organized

social classes, states, armies, churches, companies, parties, etc.) These networks have to do with the relations that originate them as well as with the others: a church, for example, can have not only ideological influence, but also economic, political, and even military influences. In this sense, the organized power networks are “promiscuous”: they exploit the power conferred on them by their organization to act beyond their original territory. According to Mann, the relative influx of each source of social power depends on the capacity it shows for coordinating and directing the activity of large contingents of human beings, in what regards such source of power as well as the rest. A social class, for instance, constitutes itself in the economy, from which its power can extend into political, ideological and military areas, where its influence will be highly conditioned by its organizational power.

Power in general is the faculty or capacity to procure and achieve certain goals by dominating the surrounding environment. For this, humans need to relate to nature –material life in the broadest sense- as well as to other humans, seeking social cooperation (Mann 1986: 5, 6). This seems consistent with the two “uncoupled” dimensions that Bell proposes we consider: technology and social relations, which if we extend their scope slightly further, can be termed “material” technological base and “organizational” social power relations, respectively.

Power stems from intervention over nature, from social coordination, as well as from the interaction between them. Power in Mann’s IEMP model (Ideological, Economic, Military, Political) lies in the networks, consisting of empirically observable chains of connections between concrete persons; these networks expand both as a result of the addition of new links, as well as by the intensification of the fluxes that flow through them; as a result of inverse processes they can as well contract and even disappear (Collins 2006: 22). The power of each network or sub-network –according to a schematic formulation- depends on its organizational capacity and its technological base, but also on the interaction between both of these. We will therefore try to attend to all three aspects: technology, organization and interaction between technology and organization.

These are “bi-directional” interactions. The different forms of social coordination (especially production relationships) can either favor or hinder the expansion of the material capacity for action (especially production forces). Inversely, potential or truly available technological means can promote certain organizational modalities to the detriment of others. The interactions between destructive technology and the organization for war offer examples of very diverse possibilities. This is also the case concerning interactions between communicational technology and state organization.

There is interaction between the two dimensions pointed out by Bell, but not symmetry. On the one hand, power lies in organized networks and therefore first and foremost on those who direct them, coordinating and activating people, as well as controlling information and incentives related to the use of resources. On the other hand, even if the usually interrelated organizational and technological changes are both potentially relevant, the second would appear to have an especially cumulative character, not very easily reversed, accelerated, and ever more influential.

We do not generally revert from the stage of machine guns to that of slings, or from that of telephones to smoke signals, or from automatic to manual production. Technological differences appear to gravitate more and faster.

Japan was able to prevent the penetration of the commercial and manufacturing West of the 17th century, but not that of the industrial West two centuries later. Soviet Russia became industrialized and defied the industrial West in the mid twentieth century, but a few decades later lost the competition, and even collapsed, whereas in other regions there was an accelerated transition to a knowledge-based and innovation-driven economy.

Looking to reality from the previously described conceptual viewpoint, it appears that the organizational capacity to generate, control and exploit technological change has a growing influence on power differentials. (A less schematic formulation of this conceptual framework is provided by Arocena and Sutz 2012b)

The capitalist knowledge society

In “central countries”, the economy is based on knowledge and driven by innovation (de la Mothe and Paquet, 1996). But this description needs to be broadened. If we take into account the technological base as well as the relations of organized power, what has been seen, at least since the 1980’s, has been the emergence of a capitalist knowledge society, whose impact at the scale of the whole planet is the true motor of the second era of globalization. A principal factor of this process is the interaction between the revolution of information and communication technologies on one hand, and the restructuring of capitalism on the other (Castells, 2000). This revolution accelerated a process already initiated by the wedding of science and technology, reinforcing knowledge as the central nucleus of the technological base by which social power relations are sustained. The combination of knowledge with the restructuring of capitalism is the key explanation to what Halperin (1992) summarized as “the victory of capital over labor, and even over the state”. In ideological terms, this victory comprised that of neoliberalism; whereas politically, it constituted the erosion of the welfare state and of social legislation; economically, it implied the affirmation of power on the part of large transnational business networks with financial capital in dominating places. The configuration of a capitalist knowledge society naturally fosters the tendency towards the privatization of knowledge. A notable example of this is “the second enclosure” (Boyle, 2003) which, as with the previous confiscation of communal lands converted into private property, transformed a wide range of ideas and discoveries about nature, once considered as common knowledge, into private property. This promotes the capitalization of the various activities related to higher education and research and their applications, which has been referred to as academic capitalism (Slaughter & Rhoades 2004). This privatization makes it difficult to use advanced knowledge for the purpose of improving the quality of life of poorer people in underdeveloped contexts, to such an extent that in the area of health it has been compared to the effects of weapons of mass destruction (Weber and Bussell, 2005: 82). Once that advanced scientific and technological knowledge became a factor of growing importance for the technological base of power relations, the economic

networks of capitalist type proved to be the most suited to control and exploit them. These networks were able to broaden their organizational power, making it more gravitating for the other power relations as well. Not only was the power of the state weakened, but the influence of capital on governmental decisions was broadened. Felipe González recently stated that “the displacement of real power from the representatives of democracy to the financial decision centers throughout the world occurred during the last 25 years, has not been reverted”. [El País de Madrid, 24-7-2012] The expansion of economic power over political power gives liberal democracy, especially in the United States, a marked plutocratic character. It can be assumed that the renewed importance of financial capitalism has a lot to do with its increased capacity to coordinate economic activities when these become more complex, involve a growing quota of accelerated information, are geographically extended, and are increasingly overpowering the public sector capacity to to control and direct them. The organizational power of the financial sector strengthens its overwhelming predominance.

On the generalized Matthew effect

In the second era of globalization, inequality appears to be increasingly linked to the position occupied in the system constituted by "centers" and relatively peripheral regions (Milanovic, 2011). In the “centers”, an economic dynamics with a strong demand for high level capabilities and advanced knowledge consolidates, constituting thus the main promoter of the expansion of higher education and of a research increasingly related to the introduction of “new combinations” in the production of goods and services. This results directly from the fact that those are knowledge-based and innovation-driven economies. Economies that cannot be characterized in this way are “non central”, more or less peripheral, with greater or lesser potential for overcoming their peripheral condition.

This condition is more severe the lower the market demand for knowledge is, and in particular for the endogenous production of knowledge. The problem of

knowledge for peripheral regions is that this situation inhibits knowledge generation and use (Arocena and Sutz, 2010).

Generally, knowledge as a resource increases in relation to its use and likewise diminishes when it is not used, as a result of either weakness of supply or lack of demand. This reminds us of the “Matthew effect” that Merton (1968) detected in the academic reward system, inspired by a verse in the Gospel, where Matthew states that he who has plenty will be given abundance and he who has little will have it taken from him. In a society based on advanced knowledge, those who have the opportunity for high level learning and for working in conditions that promote continuous learning, strengthen their ties to certain keys of power, whereas the contrary occurs with those who do not have these opportunities. There seems to be a generalized Matthew effect regarding knowledge and learning. If this is the case, the general trend towards an expansion of inequality, observed since the 1980’s (Held and Kalla, 2007) does not respond only to the prevalence of neo-liberal policies, but is also based - directly- on the growing role of advanced knowledge, as affirmed in the quote by Tilly included as an epigraph to this text.

4.- The democratization of knowledge as a guiding thread for a propositional approach

From the statements herein, and especially from the assertions at the end of the preceding section, we conclude that the paths towards a human and inclusive development must undergo a *democratization of knowledge*. This guiding thread leads us to see innovation policies as social policies in terms of the support for the effective construction in the “South” of innovation systems with inclusive traits (Arocena and Sutz, 2012a). The low market demand for knowledge characteristic of underdevelopment results in frequent under-utilization of even the weak offer of knowledge that already exists, weakening further the knowledge capabilities in place, which took a great effort to build. In the case that research and innovation can be linked in order to attend problems

of social inclusion effectively (improving to some extent how certain problems are dealt with) and efficiently (achieving a better use of resources which are often wrongly spent on expensive solutions that are neither adequate nor able to expand the endogenous capabilities), this will represent a path towards democratization with expansion of knowledge.

Understanding innovation as an interactive, distributed and (desirably) systemic social process is to introduce civil society into the matter. This does not simplify problems, rather it complicates them; however, it outlines a link between the expansion of capabilities and freedoms from the multiple “agency” of people, on one hand, and on the other hand economic development, understood schematically as (economic) growth plus (technical-productive) innovation. The link between Innovation Systems and civil society does not imply an idyllic view of these, but it appears to be relevant when considering the problem of development. This should not imply undervaluing the real and the potential role of the state, or ignoring the gravitational effect of market relationships; much less, imagining civil society as representing an environment of virtuous and disinterested cooperation par excellence. Under certain sporadic historical circumstances, this is not far from the case, or at least appearing to be the case, as a consequence of the meeting of hopes and efforts of very different origins focused on a common goal, such as ending dictatorships by building solid and large majorities against them. But civil society always is the space for particular interests and opposition between groups.

The theory underlying the analysis of the National Innovation Systems (NIS) refers basically to learning processes where organizations and actors interact (Lundvall 2010: 331). The result of these interactions largely depends upon the relative power of those who participate in them. This is why, especially under the conditions prevalent in the South, the concept of the NIS refers to situations where conflict is present. The examples of possible conflict include the following: the relative weight of entrepreneurship, the government and the academy in the definition of research agendas; the measure to which decisions at State level take into account the impact such decisions will have on national capabilities with reference to innovation, the degree of worker participation in

decisions related to the introduction of new technology in production. The configuration of the NIS is not socially neutral: It affects different groups differently, eventually favoring some and even threatening others. (Arocena and Sutz, 2002)

The NIS can be considered as groups of actors (real or potential), together with their (stronger or lesser) interactions. Which are the “sources of social power”, in the definition offered by Mann, promoting the consolidation of organized power networks that give consistency to the NIS? Firstly, without a doubt, economic: a NIS exists if relevant economic networks are benefited by the generation of innovations and competencies within the national framework, thus promoting these.

The historic experience of industrialization suggests that economic dynamics have not been sufficient on their own to promote the effective construction of NIS. In relatively successful cases, strong influences are registered which, although highly dependent on context, do come from the political, the ideological or even the military. To evaluate the perspectives of a NIS, one must consider which groups might be benefited by the expansion of the system. Khan and Blankenburg (2009), analyzing various national examples of industrial policy, show the effect of the distribution of organizational power between different ownership groups, the public sector and multinational companies in the effectively implemented strategies.

When one aims to build an “inclusive” NIS, it is relevant to ask about the distribution of power within the system, and specifically, to find out the organizational power of existing or potentially emerging networks with material and spiritual interests pointing to the promotion of inclusive type of innovations and of accumulation of capabilities. The possible results of knowledge policies depend highly on the specific responses each country gives to these issues. Emerging innovation policies considered as part of social policies have strong normative foundations and mobilize embryonic networks consisting of academics, policy makers and NGO's. A fundamental question which must be asked is whether these policies are ideologically related to significant “popular actors”, parties and social movements; an affirmative response appears to

require feedback between these policies and a more general ideological outlook concerning the democratization of knowledge. In the case of innovation policies considered as social policies, given that the articulating role of the state is still more important and needs to connect more diverse actors than in other innovation policies, the above question must address which sectors of the state apparatus may be willing to promote these tasks of connection and articulation. This begs the question of which economic interest may promote the emergence of organized networks involving these innovation policies. In this respect, an analogy can be made with the protection of “infant industries”. In this case, this would point to a type of specialization with high value added in the form of knowledge and skills related to social inclusion. These protection for learning could be assessed according to success indicators in social policies, by the quantity and quality of related R&D, the linkages produced to fulfill these activities, or the volume and quality of the occupation generated.

Innovation policies considered as social policies clearly belong to the set of democratic knowledge policies, particularly because they are directed towards decreasing certain aspects of inequality, and because they must interactively include a diversity of voices. If they can grow within the interstices of the dominant trends, they will be able to contribute to the emergence, in peripheral countries, of economies somehow knowledge based and innovation driven, not necessarily incompatible with the democratization of knowledge.

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