

## **Can Social Technology be an alternative for Social Economy enterprises?**

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## **Abstract**

*This article aims to expose and analyse the concept of Social Technology and its potential of use at Social Economy enterprises. The roots and definitions of Social Technology are exposed to provide a discussion around the suitability, and limits of ST for the Social Economy enterprises.*

*Este artículo se intenta a presentar y analisar el concepto de Tecnología Social y su potencial de uso en los emprendimientos de la Economía Social. Las orígenes y definiciones de Tecnología Social (TS) son expuestas para generar una discusión acerca de la validad y limitaciones de la TS para los emprendimientos de la Economía Social.*

*Cet article vise à présenter et analyser le concept de Technologie Sociale et ce potentiel d'usage dans les entreprises de la Economie Sociale. Les origines et définitions de la Technologie Sociale (TS) sont exposées pour motiver une discussion sur la validité et les limites de la TS pour les entreprises de la Economie Sociale.*

## **INTRODUCTION**

This article will present the concept of Social Technology with two different approaches used by Brazilian NGOs: *Instituto de Tecnologia Social* and *Fundação Banco do Brasil*. It is believed that Social Economy and Social Technology have some similarities and possibilities of intercooperation. The discussion presented here is mainly based on Ueno and Otero (2005) and brings in the conclusion some possibilities of interchange and cooperation between the two approaches.

Established literature about Science and Technology usually refers to specific actors involved in its production namely universities, research institutes and government<sup>1</sup> The same way, the studies about application and dissemination of technology usually refers to these institutions. After the World War II, companies were also included especially when dealing with the concept of innovation. Ideas like “Research and Development”, “Technological diffusion”

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<sup>1</sup> Acevedo 2006 brings a comprehensive scenario and historic dimension in the relations among Science, Technology and Society.

and “Innovation” were actually built with their focus on universities, research institutes, government and companies.

Non Governmental Organizations (NGO) and Institutions which develop social projects were not analyzed as producers and disseminators of Science and Technology. In recent years, in Brazil, some NGOs started to think about these actors as knowledge producers. The concept of Social Technology (ST) has been built opening a space to NGOs to be recognized as knowledge producers. In the same time, the Social Technology concept helps these actors to think about their social work also as knowledge construction, which must be carefully registered and analyzed.

This article aims to describe and raise the awareness about the concept of Social Technology as well as its roots and meanings in the Brazilian context. By clearing the this concept, this article aims to expose some practices which have a great potential to transform the reality and communities’ capacity for participating and changing their own environment.

## **METHODOLOGY**

As a way to clarify the Brazilian context and the nature of NGOs, the first point to be exposed is some historical facts that resulted in the current universe of Brazilian NGOs, specifically those related to grassroots activities. In a second moment it will be discussed about scientific and technological (S&T) concepts, parameters and indicators. Here we may see that the existent international framework to conceptualize and understand S&T is not completely adequate for analysing NGOs activities as knowledge production. Finally, it will

be proposed the Social Technology concept, as it has been developed in Brazil, and how it can help to understand some NGOs activities as knowledge production.

The abovementioned objectives will be reached through review of a bibliography concerning nature and history of NGOs, S&T, ST, and information collected during the period in which the authors had been working for *Instituto de Tecnologia Social* (ITS).

Given the recent nature of the idea of ST, the literature is limited and concentrated in publications of ITS and *Fundação Banco do Brasil* (FBB). This comprises brochures and publications of events promoted by the mentioned organizations. These two different approaches regarding Social Technologies will be exposed and compared in this study. Afterwards it will be possible to visualize the different contributions of concepts built by ITS and FBB.

The work experience of the authors plays a key role in the reflections contained in this study. Many of the information here mentioned has been collected in a non structured way between 2003 and 2005. This material comprises personal notes of meetings and seminars organized in ITS and meetings that resulted in the concepts proposed by FBB and ITS.

The data collected refers mainly to:

- Minutes of meetings
- Brochures containing reports of seminars discussing ST
- Informal interviews with members of Social Technology Institute
- Focus group to discuss the concept of Social Technology

Some characteristics and history of NGOs in Brazil are very particular. In recent years, terms like “Third Sector” and “NGOs” are mostly used like having the same meaning. However, the social construction of these concepts reveals different histories and different meanings.

Even so, nowadays these two terms are used like referring to the same kind of organizations. This study will make use of the term “NGOs” in spite of organizations of the “Third Sector” given the nature of the organizations analyzed. The differences and similarities of these concepts will not be discussed once it is not directly related to the topic presented<sup>2</sup>.

## **THE BRAZILIAN NGOs**

The construction and diffusion of the term “Non Governmental Organization” happens in 1980s in Brazil as in other countries in the world (Landim, 1993, Landim, 2002). Apart from the first use of the term in the international level, in Brazil there was a group of organizations which started to name themselves as NGOs. These organizations were, in many cases set up before the emergence of the term “NGO”. After all, what of organizations is being dealt with?

From 1964 to 1985, Brazil was under a dictatorial government which prohibited and persecuted social movements and leaderships who were fighting for democracy and social participation. The political parties were also forbidden. But, as Sader (1988) said, these social movements “constituted a new public space beyond the system of politic representation” (p. 314), not substituting this system, but opening new possibilities for politic participation. These movements were characterized most by an engagement in solving social problems such

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<sup>2</sup> Na extensive discussion around the meaning of terms like “NGO”, Third Sector, Social Economy and its respective meanings are available at ALVES (2002)

as lack of sanitation, healthcare, and public schools in slums and impoverished areas. The roots of their discourse were based in three matrices:

- 1) The “Teologia da Libertação” (Liberation Theology): a Catholic Church approach which was involved in “popular education”<sup>3</sup> and popular causes
- 2) The emergence of the “new syndicalism” after the dismantling of the Brazilian syndicates’ framework during the years of dictatorial governments, and finally
- 3) Leftist groups which were looking for new ways to work together with the workers class in order to promote social changes (Sader, 1988).

In fact, it is assumed that the emergence of social movements in many countries was related with changes in the kind of discourses and practices adopted by popular groups. In the Brazilian context, like in others, “Big causes” like Socialism or Communism were left behind and concrete problems of infrastructure and “group identity” began to be crucial aspects in social movements (i.e. SADER, 1988, MELUCCI, 1991).

In Brazil, there were many persons engaged in assisting and accompanying these social movements promoting “popular education”. However, they could not act openly due to the dictatorship and political restrictions. These groups of activists acting as supporters<sup>4</sup> of social groups are identified as the origins of NGOs (LANDIM, 1993, LANDIM, 2002).

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<sup>3</sup> The Popular education was a strong social movement that acted in Brazil during 1970s. The main author in this approach was Paulo Freire (1921-1997). The popular education was based in the principle that the process of education had a dialogic dimension in which teacher and student interact in a non hierarchical relation. His pedagogic method privileges the concrete experience of life from the learner.

<sup>4</sup> The support promoted by these activists was technical and not financial. It was a work helping the social movements to organize themselves, or developing the communities through popular education, healthcare, etc. 6

In the beginning of the 1980s decade, Brazil begins the political aperture, and NGOs began to construct a new identity: existing themselves as organizations and struggling for their own agenda (including the development of social movements) instead of existing **for** social movements.

In 1980s we have the diffusion of NGOs, with many of them having financial support of International Cooperation Agencies and their social work being based in their relations with social movements (OTERO, AZEVEDO and RODRIGUES 2003). Additionally, the relation between NGOs and State changes: before this relation was mostly hostile because of dictatorship. After the establishment of a democratic government, NGOs and State began to work in partnerships, designing and implementing projects together. However, it is important to observe that the cooperation between NGOs and State is not always a peaceful relationship. If by one side NGOs and Government can cooperate, NGOs are also playing their social and political role, especially in advocacy programs, discussing, and some times criticising the action of the Government. Sometimes clashing with the State agenda (OTERO, AZEVEDO and RODRIGUES 2003).

In 1990s another period of large expansion in numbers of NGOs happened, and the major recognition of public opinion about the existence and importance of NGOs. As a sign of that, several Brazilian NGOs took part of International Conferences such as “The United Nations Conference on Environment and Development”, in 1992 (Rio de Janeiro-Brazil), or as “The International Conference on Population and Development”, in 1994 (Cairo-Egypt).

Despite the current and extensive use of the term “NGO” that makes it imprecise and uncertain to design a specific profile of organizations, this study will refer to NGOs the

organizations which are engaged in social projects working with vulnerable populations (in broad sense) that promote social transformations and Human Rights with active participation of populations' members. NGOs as characterized here, can establish cooperation with the State. However, in some cases, their role of questioning and dialoguing the State's actions and policies may collide.

## **SCIENCE AND TECHNOLOGY EXISTING PARAMETERS: POSSIBILITIES AND LIMITS TO UNDERSTAD KOWLEDGE PRODUCTION IN NGOs**

Before the explanation of the Social Technology concept and its relation with the method of intervention of NGOs, it will be presented some references about the definitions and parameters for measurement of Science and Technology.<sup>5</sup>

The current concepts and parameters to understand and measure scientific and technological activities were developed having as model types of organizations like universities, companies departments of Research & Development and other institutions that differ from NGOs. The use of such references resulted parameters and indicators not really sensible to evidence and understand the knowledge production of the NGOs.

The construction of parameters for understanding and measuring science and technology has been discussed in several countries. Usually, the evaluation of Science and Technology presuppose that scientific and technological development drives to an economic development.

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<sup>5</sup> These references are namely: *The Frascatti Manual - Proposed Standard Practice for Surveys on Research and Experimental Development* by the Organization for Economic Co-operation and Development (OECD, 2002); *Recommendation concerning the International Standardization of Statistics on Science and Technology*" United Nations Educational, Scientific and Cultural Organization (UNESCO, 1978)

There are several indicators and manuals to measure scientific and technological activities. Here it will be described “The Frascatti Manual - Proposed Standard Practice for Surveys on Research and Experimental Development” by the Organization for Economic Co-operation and Development (OECD, 2002) and “Recommendation concerning the International Standardization of Statistics on Science and Technology” by United Nations Educational, Scientific and Cultural Organization (UNESCO, 1978). These two documents are references utilized by Science and Technology Ministry from Brazil for measuring national investments in Science and Technology<sup>6</sup>.

The “Recommendation concerning the International Standardization of Statistics on Science and Technology” was adopted by UNESCO in November, 27<sup>th</sup> in 1978. This document intends to create parameters and definitions for standardization of statistics relating to science and technology in the world always respecting local realities.

UNESCO, in “Recommendation concerning the International Standardization of Statistics on Science and Technology” defines scientific and technological activities as:

“Systematic activities which are closely concerned with the generation, advancement, dissemination, and application of scientific and technical knowledge in all fields of science and technology. These include such activities as R&D, scientific and technological education and training (STET) and the scientific and technological services (STS)”... (UNESCO, 1978).

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<sup>6</sup> site: [http://ftp.mct.gov.br/estat/ascavpp/gti\\_web/metodologia.htm](http://ftp.mct.gov.br/estat/ascavpp/gti_web/metodologia.htm)

The definitions presented in this document are broad to embody a wide variety of activities, encompassing a point of view that scientific and technological activities belong to a larger systematic process in which “formal knowledge” (related to formal disciplines, regular school and specialized learning) has a central role. Apart from any judgment, these definitions correspond to the widespread point of view for scientific activity.

Additionally, “Recommendation concerning the International Standardization of Statistics on Science and Technology” (UNESCO, 1978) defines personnel dedicated to scientific and technological activities as “scientists and engineers, and technicians (SET) and auxiliary personnel” devoted to such activities “full-time”, “part-time” or in a “full-time equivalent”.

This classification has as supposition that is possible and necessary to distribute the time work of a person in parts, and distinguishing clearly when a person is doing scientific and technological activities, and when is not. This classification also has as supposition a static separation between scientific and technological production activities and other activities. Given the organizational structure of NGOs and even their scarcity of resources, it is very difficult to imagine an organization in which it is possible to classify personnel activities and work in accordance to this definition.

Finally, “Institutions carrying out S&T activities” are defined as “any institution engaged in S&T activities on a permanent and organized basis” (UNESCO, 1978). This broad definition can entail a wide range of organizations. However, “permanent and organized bases” seems to have as assumption that organizations which have the knowledge production or dissemination may have production of knowledge as their core activity. NGOs, as characterized here, have as primordial objective the solution of social problems or the

organization of community thus being unable to be regarded as producer of knowledge according to this criterion.

The first edition of Frascatti Manual was published in 1963. In 2002, the sixth edition was published aiming to create standards for measurement of human and financial resources devoted to research and experimental development (R&D) in the context of the global economy. This manual intends to be consistent with UNESCO (1978), which recommendations are for *all* scientific and technological activities. However, the Frascati manual was developed for “specific to R&D and to the needs of OECD member countries, whose rather similar economic and scientific systems distinguish them from non-OECD countries” (OECD, 2002, p. 15). It is important to remember that the members of OCDE are mainly developed countries.

The “Frascati Family”, includes manuals on R&D (Frascati Manual), innovation (Oslo Manual), human resources (Canberra Manual), and technological balance of payments and patents as science and technology indicators. These manuals are fundamental for the development of international statistics about scientific and technological data, and also to understand the relationship between investment on science, technology and economic development.

As far as knowledge is a social construction, concepts constructed under certain realities are more suitable to the realities in which they were constructed. The utilization of these parameters for analysing other realities can be useful, but it also has limits. These limits do not refer only for the application of the definitions, but also for analysing other countries with different social and economic conditions (UNESCO, 2002). Additionally, the standards

proposed by the aforementioned documents are not able to embrace organizations which did not participated of the construction of these metrics.

One last limit for using current parameters of science and technology to analysing NGOs activities is about a “timing aspect”, the so called linear process of science and technology. This approach assumes that, scientific development (the production of pure Science) leads to technological development (creation and registration of patents of methods, processes and machinery). In a further stage, technological development leads to economic development measured mainly by the growth of the GDP, which finally results into a social development understood as the better income distribution and right fulfilment of individual rights (Dias, 2005). This long process can be unfolded in other stage as following.

The academic research is divided in two major types: the basic and the applied research. In the first case, there is an effort to discover new contents, concepts or ideas launching a reference for further studies which can refine the subject or discover new applications to it. It does not have some guarantee of some practical gain. (DAGNINO, BRANDAO & NOVAES, 2004)

The second case, the applied research aims to develop methods, artifacts, processes or products to address a practical and predetermined question. Here, some of the concepts and ideas of basic research can be used as subset to develop a new product, process or method, in other words, a new technology. This stage emphasizes the application of knowledge to solve a determined problem or demand raised by one stakeholder (communities, industries, government). In the further stage, the new technologies have to be disseminated turning into the economic gains turn into social benefits.

The time taken from the basic research to the social development is usually too long. The production of knowledge by the NGOs intends to shorten this period. In most of the cases, the development of STs does not follow all these steps, as described by this “linear process”.

The way of acting NGOs is based on actual and current social problems. The organizations on the grassroots have usually concrete problems such as unemployment, need for sanitation, lack of resources for harvesting, need for healthcare. In this perspective, the necessity for solutions comes prior than the discovery of new concepts or the evolution of a theory.

In this way of acting, the main objective is the solution of the social problems. On the other hand, it does not mean that the use of theories is denied, neither that, these solutions cannot contribute to a development of a theory. On the contrary, the science and technology are many times used and can leverage the development of new solutions or improve existent solutions. Other times, they come as tacit knowledge for the development of solutions. Concepts can be built and new theories can be developed from the intervention of the NGOs. In all the cases the theory comes along with the action in a virtuous cycle.

This practical way of acting of the NGOs can be explained in part by the values by them assumed. As prioritizing the social effects, the NGOs can broaden the field of generation of knowledge. This knowledge created by them brings new values to the agenda of Science and Technology system: the social impact of science and technology, the necessity of measuring results other than technical and economic factors, and the need for diffusing the new technologies, as well as the use of scientific knowledge to solve social problems.

The values and the organizational structure of the social organizations are not the only factors that make the practices of NGOs different. The development of new applications in other places than research centers, laboratories and universities is a new character of this production. Many NGOs assume that the grounds of the communities are a fertile soil for the development of new experiences.

The program *Um milhão de cisternas* (A million cistern program) is a good example. This program was launched by the federal government of Brazil. It consists of building 1 million water tanks of small capacity in semi arid areas.

Initially, the designing of a cistern was made by a construction worker whose profession was building swimming pools. Using his skills, he developed a rainwater harvesting system which collects water to a tank using the roof of the houses to collect the water during the rainy season. In the draught season, the water is used for the human consumption and also for harvesting. Due to its capacity (16 thousand liters of water) the system avoids the shortcomings derived from big dams such moving populations settled nearby river beds and alterations in the ecosystem.

This example shows the development of a technology by a person who is neither a researcher nor a scientist hence excluded from academic knowledge and far from laboratories or researching centers. However, the social impact of this invention had a considerable impact, being eventually adopted by the government. Although the inventor is not a researcher, he uses a tacit knowledge in construction techniques, permeability and resistance of materials and others, principally a knowledge acquired by the practice. Nowadays, NGOs and researchers in institutes or universities are collaborating to better develop this solution as

how to maintain water healthy when it stays long period in the tank, use of pre moulded concrete, and reducing the costs of building.

The development of the technology of rainwater harvesting cistern points to the fact that the technological design and engineering is not necessarily as rigorous as the scientific development, as exposed by Acevedo:

“the technological theories are based on the designing, assembling, behaviour and evaluation of artifacts and technological systems; in other words, comes always from a reflection about a technological practice. Even so, the criterion of validity of a technological theory is not as rigorous as verisimilitude (scientific rationality) if it works and has some utility (technical rationality). (ACEVEDO 2006, p. 15)<sup>7</sup>

On the other hand, in further stages, the system was refined incorporating technical improvements made at research centres showing that the interaction between theory and practice, NGO and actors from the S&T technology system can happen and it is positive.

The main point of this example is the broadening of the *loci* where a technology is developed. The way of acting of the NGOs assume that the grounds of a community can be a *locus* to develop technologies for the own community recognizing the elements that compound such context and filling the gap that exists between a scientific concept until the solution of a social problem.

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<sup>7</sup> Las teorías tecnológicas están centradas en el diseño, la construcción, el comportamiento y la evaluación de artefactos y sistemas tecnológicos; esto es, suponen siempre una reflexión sobre la práctica tecnológica. Así mismo, el criterio de validez de una teoría tecnológica no es tanto que sea verdadera o verosímil (racionalidad científica) sino que funcione en la práctica y sea útil (racionalidad técnica).

The generation of knowledge by the NGOs is a reality in some fields. Nevertheless, the evaluation of such experiences is not embraced by the system of Science Technology and Innovation. In the Brazilian case, there is still a lack of funding schemes and promotion of this new sort of knowledge.

Recent efforts show that a new space is being created. In 2003, the ministry of Science and Technology created the Secretary of Science and Technology for the Social Inclusion. It is important to mention the creation of this institutional space and also the adoption of the term “Social Technology” by a fundamental actor in the Brazilian system of Science and Technology.

Nonetheless, the development of an institutional framework (regulations, funds, participation in the councils of governmental funding agencies) that guarantees the continuity of this space is not yet a reality.

## **SOCIAL TECHNOLOGY: BUILDING AN ALTERNATIVE APPROACH**

The idea of technology is generally associated to machines, tools, computers and instruments. In other words, artificial products produced by the man (KLINE apud ACEVEDO, 2006). This idea is mainly related to outputs of engineering processes.

Nevertheless, technology embraces other additional meanings. Kline (1985) proposes also the following streams of meanings:

- The technical knowledge, methodologies, skills and abilities needed to design and do productive tasks (activities related to technical skill, know how)
- Human and material resources of the socio technical system of production.
- The socio technical system needed to the use and maintenance of the produced products, including legal aspects. (KLEIN apud ACEVEDO 2006 p. 3)

These dimensions still do not embrace the relationship of the resources to the environment and the human being. They are solely related to technical criteria.

Acevedo (2006) proposes a “broadening in the senses” of what is understood as technological practice. To do so he proposes the division of the practice of technology comprising four dimensions, being the fourth a background of affective dimension where the three first dimensions lie on:

- 1-Technical dimension**, the elements associated to the general understanding of technology;
- 2-Organizational dimension**: elements comprising social and political elements;
- 3-Cultural ideological dimension** which form the cultural environment in which designers and inventors live and are influenced by;
- 4-Affective dimension** which entails the reaction of individuals, social groups towards technology as well as the value they attribute to it. (ACEVEDO 2006, p.4)

As organizational and ideological elements enter to the notion of technological practice it is possible to visualize a broader idea of technology that does not stand only on technical elements or tangible elements (machinery and tools). The consequences of this approach

convey to broader idea of technology which include human elements and include different implications to the technology like the social effects it has.

As exposed above, the conventional system of science and technology is usually assessed according only to technical criteria. The implications of technologies in terms of organizational, cultural and affective dimensions are in many cases disregarded. As new elements enter the idea of technology, it is needed a social control and a wider set of indicators to evaluate and measure the production of technologies.

## **SOCIAL TECHNOLOGY FROM TWO DIFFERENT PERSPECTIVES**

The concept of Social Technology, in Brazil, is usually linked to two organizations which have been discussing about this theme namely Brazil Bank Foundation (FBB) and Social Technology Institute (ITS). By deepening these two approaches we may be able to understand better contributions of the ST concept for suggesting good practices for social projects and for scientific and technological investigations.

### *Social Technology for Fundação Banco do Brasil (FBB)*

*Fundacao Banco do Brasil* (Bank of Brazil Foundation) is a non profit organization established in 1988. In the first years, the foundation has acted funding social projects in various areas of Brazil. Since 2001, FBB organizes the Social Technology Award changing

its orientation to disseminate and articulate social initiatives involving, NGOs, universities, government, foundations, and institutes.

The mission of FBB, according to the website is: “Mobilize, articulate, and manage actions of social change promoted by citizens, private, public, and third sector organizations which aim the social inclusion and the promotion of citizenship in a sustainable basis with quality of life for all”<sup>8</sup>.

In 2004, FBB started the cooperation with a wide variety of organizations in order to launch the *Rede de Tecnologia Social* (Social Technology Network). The concept presented following is the result of the launching of the Social Technology Network (STN). Since FBB is one of the financial supporters of STN and utilizes the same definition of ST of STN, we are assuming here that the point of view about ST concept presented in STN reveals the point of view of FBB. The main source for ST concept for FBB was the publication “*About an analytic-conceptual framework for Social Technology*” (DAGNINO, BRANDAO & NOVAES, 2004).

The conceptual development of STN relies on two basic assumptions: the consolidation of an analytic conceptual mark and the establishment of the network.

The first character refers to a review on the theory about Science and Technology and an enunciation of principles and basic values for ST, having as source the theories about the Science and Technology system in Brazil and also in an international level.

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<sup>8</sup> <http://www.fbb.org.br>

According to Dagnino et al. (2004), there are four steps that contribute to visualize and establish the concept of ST: 1) criticism on Appropriate Technology, 2) economy of innovation, 3) sociology of innovation, and 4) philosophy of technology. Each of these steps carries some important elements to the ST concept.

The main characters of the Appropriate Technology are: low cost of capital, small or “human scale”, simplicity, and respect to the environment. These characters come from the perception that the technologies adopted by the developed countries were not suitable to the developing countries.

The movement for Appropriate Technology was criticized in the further years for the following reasons: a) it takes as assumption the idea of neutrality of technology and the linear development of technology, b) the generation of appropriate technologies had been done in industrialized countries far from the target communities and with low level of their participation in this process, c) the appropriate technologies does not change the structure of production of the developed countries, d) it regards the target communities solely as beneficiaries of Appropriate technologies. It did not recognize the target communities as potential producers of Science and Technology, e) finally, there was a criticism that, in many times, the Appropriate Technologies did not represent an innovation. They were only downgrading of conventional technologies adopted by the developed countries.

The Appropriate Technology movement contributed to the development of ST as it regarded that the technological set ups of developed countries are not always useful for the developing countries. Schumacher (1973) expressed a concern to develop technologies under other assumptions more suitable for the socio economic environment of countries of the third

world. Additionally, some features of appropriate technology are still useful to understand STs.

The theory of innovation points to the fact that the process that results in an innovation does not depend only on technical criteria. This theory was based on the criticism of the model of supply and demand for technology where the development of a new technology depends on a demand of a new technology clearly expressed which establishes the attributes of a new artifact that has to be developed by the system of technological research.

By contrast, the theory of innovation regards the innovation as a product of the interaction of several factors like culture, economic criteria, financial between others broadening the perspective about the system of science and technology as it assumes that the technologies are not neutral.

The theory of innovation has a key role to understand that the science is not neutral as it recognizes new elements that influences the scientific production (cultural factors, social factors, ideological factors). Also, it reveals that the production of S&T is not only defined by scientists, researchers and engineers. This process is influenced by all the stakeholders, including consumers, governments and other agents.

The sociology of innovation argues that the innovations can be influenced by the actors of society and are chosen among a set of different possibilities created by network of social actors, all of them technically viable and with different attributes. This network of social actors, the actor-network, is compounded by social and cultural elements included the inventors, engineers, researchers, consumers, managers, and also workers, government

agencies, final users of the innovation (DAGNINO et. al. 2004) The tensions, interests and power carried by the agents of the actor network decide the option for an innovation in spite of other technically viable solutions.

The philosophy of technology is cited by Dagnino et. al. (2004) as an important point to understand the STs. The critical theory of technology is based in two basic assumptions: the technology is not neutral and it is controlled by the man in opposition to the technologic determinism.

The author mentions that not only technical factors, but also economics, social, political, and cultural factors influence the environment of technology. In other words, technology does not behave and benefit equally its beneficiaries once the interaction with the socio technical factors varies.

Once it is understood that technology is not neutral, Dagnino et. al (2004) uses the two further steps (sociology of innovation and philosophy of technology) to expose the relation among the actors that influence the process of S&T. Here, it is pointed the differences of power and values assumed by the actors, and possible limits to new forms of producing Science and Technology.

Considering some elements of the above mentioned theories, the analytic conceptual mark of Social Technology emerges taking the socio technical suitability as an assumption. Here, three attributes of the STs are reinforced:

- a) The necessity of adapting the conventional technologies to the social substrate of the places were it is applied,

- b) Stimulate participatory methodologies of decision making processes of work, and
- c) The respect to environmental issues.

The launching of the Social Technology network constitutes the second assumption to the concept proposed by FBB. This network is compounded by different sectors of society such as the government agencies, the academic community, and the social movements affirming the participatory and plural character of the network as well as the political factors that underlies the development of STs.

As a result of the reflections exposed, the STN proposes the following definition to Social Technology same as the definition adopted by FBB.

“Social Technology comprises products, techniques or methodologies ‘re applicable’ developed from the interaction with the community and which represents effective solutions for the transformation of society.” (Fundacao Banco do Brasil)

The concept presented by STN has a strong character on reviewing the theory on Science Technology and Society and the implications of it. This approach exposes, in a way, the “genealogy” of the concept of ST explaining the origin of some features that compound this new concept.

The FBB play an important role for the development and conceptualization of Social Technology. The initiative of promoting the Social Technology award has a substantial

contribution to disseminate the concept and the practices of social technology. Additionally, the award has also helped to generate organized information about Social Technologies.

The establishment of STN is another endeavour which helps to promote ST as a practice allying different sectors of society and constituting an institutional space for debating, creating and improving Social Technologies.

### *Social Technology for Instituto de Tecnologia Social (ITS)*

*Instituto de Tecnologia Social* is an NGO founded in 2001 by persons with long experience in social projects, social mobilization and social movements. The history of ITS is closely related to the emergence of the concept of Social Technology. The mission of ITS, as exposed in the institutional website<sup>9</sup> is: “Promote the generation, development and the deployment of technologies regarding the social interest and to allow the conditions for knowledge mobilization towards the solution of populations’ social demands”<sup>10</sup>.

The concept exposed here has as main source the publications “Reflections about the construction of the Social Technology concept” (ITS, 2004a) and “Caderno de Debates” (ITS 2004b). This concept was developed throughout the year 2004 in a participatory methodology which comprised systematization of concrete experiences where social technologies helped to solve social demands and meetings with representatives of Universities, Governmental Agencies, different sectors of civil society such as grassroots NGOs and corporate social responsibility organizations.

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<sup>9</sup> [www.itsbrasil.org.br](http://www.itsbrasil.org.br)

<sup>10</sup> “Promover a geração, o desenvolvimento e o aproveitamento de tecnologias voltadas para o interesse social e reunir as condições de mobilização do conhecimento, a fim de que se atendam as demandas da população”. 2

The necessity for understanding Social Technology as a concept came from the acknowledgement that the action of NGOs reveals some differences concerning knowledge production and application (ITS, 2004a, p. 123). By clarifying this logic it would be possible to visualize elements which can contribute to create better practices in social projects. As Haddad (2002) says, this "*modus operandi*" has a particular character: the link between theory and practice in the process of development.

Talk about STs to ITS also means to include new demands and social actors in the system of Science and Technology and legitimate the knowledge produced by the NGOs as an effective way to promote social changes.

Given the nature of ITS as NGO and the choice of adopting a non academic approach, the conceptual development conducted by ITS comprised the following activities: 1) research of meanings and institutional uses of the term "social technology" in documents such texts and institutional websites and brochures of NGOs and organizations related to the production of Science and Technology, 2) research of experiences carried out by NGOs systematized as study cases, evidencing "lessons learnt" about the cases; and, 3) participatory seminars and discussions to comprehend and debate the meaning of the term "Social Technology".

The result of this process in one year of work was the "Caderno de Debates" (ITS, 2004b), which systemize construction until then divided in 4 aspects: principles, definition, parameters, and implications of Social Technology as follows.

Principles of Social Technology are the assumptions and beliefs which are the base of Social Technology concept for ITS. So, the principles underlying ST concept for ITS are: 1) learning and participation are closely related and cannot be separated. The learning process depends on participation and also the participation results in learning. 2) Processes of social inclusion need a multidimensional perspective to be designed. The social transformation becomes possible only when the local identities are preserved; and 3) every individual is able to learn and generate knowledge as he is part of a culture and has the ability to be in touch with different sources of information.

The definition of Social Technology for ITS is:

*“The range of transforming techniques and methodologies developed and/ or applied in the interaction with communities and comprehended by them which represent solutions for social inclusion and betterment of quality of life”* (ITS 2004, p. 26)

Parameters of Social Technology are, for ITS, the characteristics and components which conform a social project as a social technology experience. Parameters may help to accurate the identification and evaluation of STs. The parameters proposed by ITS (2004b) to define a TS, are: 1) it has as objective the solution for a social demand experienced and identified by population, 2) the process of decision-making is democratic, including strategies specially designed to mobilize and motivate popular participation, 3) population and other actors involved in the project participate, appropriate and learn from the process, 4) the project have a planning methodology and the process of applying knowledge is organized, 5) there is knowledge production from the practice, 6) ST involves concern about economic, social and environmental sustainability and, finally, 7) ST involves the concern about scaling up of

successful social interventions. Therefore, it comprises acquiring awareness from effective ST experiences for further applications generating conditions for improving and widespread them.

The process of construction of the ST concept for ITS was oriented by practices' analysis. It was driven by the preoccupation of visualizing aspects which can help practitioners elaborate better projects, finally contributing for the development of communities, alleviation of social demands and promotion of better conditions of life.

ITS also elaborated and systematized "implications" for the Social Technology concept. As ITS (2004b) says: "Concepts are useful as analytical tools, which allow us to raise some aspects from reality (instead others) and to understand it from a determined point of view" (p. 30)<sup>11</sup>. So, implications of the ST concept are the aspects from reality which become evident by the approach given by this concept, or those aspects which the concept allows to understand better.

## **CONTRIBUTIONS OF THE SOCIAL TECHNOLOGY CONCEPT**

Some preliminary reflections about how the concept of ST can contribute to understand and act in social projects are presented here. The contributions of the concept comes from the reflections proposed by ITS and FBB and they are clustered in the categories proposed by ITS. (2004a, 2004b)

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<sup>11</sup> "Conceitos servem como instrumentos analíticos, que nos permitem realçar aspectos da realidade (em detrimento de outros) e entendê-la a partir de uma determinada ótica" .

- *About the relationship between science, technology and society*

The concept of Social Technology, as discussed here, show evidences about several contents related to the relation between science, technology, scientists, academic community and society, social demands, social problems.

The first point discussed is that science and technology are not neutral enterprises. As exposed throughout this study, Science and Technology involve not only technical aspects but also social and cultural factors that affect the science and technology. Hence, they affect differently the various sectors of a society.

It is not about denying the importance of research centres and the paramount importance of the university. The ST may reinforce the generation of knowledge from the grassroots filling the gap that exists between social demands and solutions. It means by one side stimulating and recognizing the production of knowledge by the NGOs and by the other stimulating the interaction among universities, government, research centres, and NGOs shortening the long path between pure science and social development.

Another point about S&T and society refers to the social control of technologies and its social and environmental impacts.

When assuming that the technology is not neutral, the concept of ST raises the necessity of social control over the production of knowledge. This control has to be done by all the sectors

of society in order to entail not only technical and economic factors. The social control has to comprise the social demands, cultural elements, and suitability the context of a locality.

Finally, discussions about ST draw the attention for the democratization and the need to promote access to S&T specially for the underprivileged classes which have less opportunity to access scientific and technological benefits.

- *About a specific objective for knowledge production*

The concept of Social Technology from the two definitions exposed enables us to understand a new field where knowledge has been developed. The adjective “social” is not accidental; it comes from the necessity, by one side of deploying science and technology to promote the social inclusion, especially for the context of developing countries. On the other side, the ST raises the need to create new solutions from the local and traditional knowledge of communities’ members.

In the present study, it was highlighted the development of technologies coming mainly from NGOs. However, Social Technology must not be regarded as a monopoly of these organizations, but, on the contrary, the idea is to claim for more engagement of academics in the solution of social demands. The concept of Social Technology helps to broaden the field of investigation to the system of Science and Technology as it brings the demands raised by the grassroots communities to become topics of scientific investigation and development of new technologies for the social inclusion and also the improvement of Social Technologies. This topic can contribute to a positive interaction between universities, researching centers and NGOs targeting the improvement of the existing Social Technologies.

- *About a way of acting which improves social projects*

This concept helps to understand the roles played by the grassroots organizations as producers of new technologies. This new knowledge does not mean exclusively tools and machinery. It comprises also participatory processes, methodologies of assessment and other forms of technology that goes beyond the so called “hard technologies”.

When proposing concepts of ST, *Fundacao Banco do Brasil* and *Instituto de Tecnologia Social* establish an effort to legitimate social organizations as producers of Science and Technology. The production of knowledge in the scope of ST raise the importance of new topics such participatory methodologies of local assessment, dissemination of successful experiences between others. The ST as a practice helps to disseminate technologies which despite being successful could stay isolated losing their potential to develop other localities.

The experiences developed by Brazilian NGOs have shown that the production of technologies and knowledge are not the monopoly of the academic universe. Many interventions in underprivileged communities unveil the potential of communities itself as producers of their own solutions regarded that the best comprehension of the culture of a particular context is given by the people that inhabit the place.

The ST emphasizes the potential of a new *locus* for the creation of solutions for the social problems. Some grassroots NGOs that have been producing effective solutions from the presupposition that the proximity to the reality of a community can help to visualize solutions more suitable to the real demands of the society. Furthermore, they create an alternative, to

the long way that exists between pure science and technologies that solve the social problems.

The governmental institutions are essential to promote ST through legal framework and funding for the untapped potential of STs. Nonetheless, such institutions must have a structure that makes easier the dialogue between the dense social networks of stakeholders involved in the process of production and dissemination of ST.

The study here presented intends to expose the initial steps given to the development of the Social Technology in Brazil. The recent nature of the concept reveals the necessity of continuing the studies, and the development of new practices in the field of social technology. The depict of the Brazilian case can be a source of information for similar endeavours in other developing countries that can start policies of social inclusion through application of Science and Technology.

These first findings can enable a more efficient application of resources in the system of S&T in order to promote the social inclusion and a better income distribution. The concept of Social Technology can be useful to design public policies that promote the interaction between academy and grassroots organizations resulting in a more comprehensive relation between Technology and Society.

The parameters of Social Technology represent by one side a valuable starting point to create criteria and indicators for the production of the knowledge generated by NGOs. And it is also a useful tool to introduce measurements of social inclusion, social impacts and benefits generated by conventional technologies.

## **SOCIAL TECHNOLOGY AND SOCIAL ECONOMY<sup>12</sup>**

The current work presents the concept and some parameters about ST and its implications.

However, it is needed to cite the relationship the TS has with Social Economy.

At first it is important to visualize that both bring the primacy of persons over work and capital acknowledging that currently the economy as prioritizes individual production relationships. As a result, the socio technical arrangement as well as the technologies are developed under such values and do not represent the best options for the enterprises in the Social Economy.

The practice of Social Economy reveals the need of a new knowledge production that takes into account its values (service to community, autonomous management, democratic, decision making, etc.). Due to its characters, ST seems to be a very suitable approach as it entails parameters regarding such principles. Additionally it points to the necessity of a system of Science and Technology able to visualize that the technological development has to go beyond the technical and economic analysis. It is needed to broaden the perception and assessment of the technologies having into account environmental and social criteria.

Both of them raise the need to generate a new management and make use of participatory strategies for its enterprises. At this point, the social technology is a positive approach that brings new values and practices that can be applicable for SE.

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<sup>12</sup> It is adopted here the concept of Social Economy proposed by Canadian Social Economy Research Partnerships (2007 p. 3).

The approach for empowerment and participation is present in both ST and SE being thus a potential of use of the assessment methods developed by some institutions dealing with Social Technology. Examples coming from initiatives based on self help groups and community oriented development are innovating in the generation of methodologies that enhance the income of underprivileged communities and strengthen the social capital.

The ST in Brazil is an example of positive interaction between researchers and practitioners to the development of new technologies. This approach can also benefit SE. Some initiatives like the “*Incubadoras Tecnológicas de Cooperativas Populares*“ and universities extensions projects have been bringing social issues inside the academic world as well as bringing researchers to the communities. It is also important to note that many NGOs have in their staff highly qualified persons including professors and graduates that have been generating Social Technologies and promoting the local development at local communities.

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