Social Technologies and Public Policies in Brazil[1]

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This note aims to document Social Technologies (STs) that have strongly influenced public policies in Brazil, as well as government efforts—through adoption/adaptation and funding—to contribute to the development and dissemination of STs. The main areas in which STs are applied (and fostered) in Brazil are adaptation to the semi-arid region and prevention of natural disasters, food security, education, energy, housing, income, water management, income generation, health and the environment.

I. Social Technologies: Concepts and Definitions

The term 'social technologies' (STs) entails different concepts and definitions but is characterised by a common view of accommodating innovative processes thought to fight poverty and social vulnerability. STs cover broad activities ranging from microcredit with solidarity/collective guarantors to interventions that aim to contest the structure of the market economy from a more radical perspective. However, in all cases, the definition of STs encompasses aspects of innovation in the use of technologies, interaction with the community, and the potential to transform social realities and to be scaled up and replicated in other contexts.

The first definition of STs emerged in the 1970s, linked to discussions around Appropriated Technology. The latter would involve technology transfer from former colonial powers to their former colonies as a means of compensation for the economic and political exploitation of the colonial past (Fraga, 2011). This approach, however, did not question the 'neutrality' content of the production and transfer of these technologies, focusing only on access (Novaes and Dias, 2010). The criticism of such 'neutrality' of these technologies was later made by the pioneers of STs theories in Latin America—namely, Amilcar Herrera, Oscar Varsavky and Jorge Sábato (Costa, 2013).

Other classical definitions of STs highlight that besides the use of technology to fight poverty and address social deficits, STs are based on the participation and empowerment of beneficiaries, including with their involvement as agents in their design and implementation (Costa, 2013). Similarly, Bava (2004) states that the defining feature of STs is the way in which the technological innovations can foster the empowerment of vulnerable groups so that these groups become agents of transformational processes in which alternative and innovative development strategies are fostered endogenously. According to Costa (2013), another feature of the STs is the right of citizens, neighbourhood organisations, solidarity economic units, non-governmental organisations (NGOs), social movements and other civil society organisations to develop and appropriate/adapt technologies to the benefit of the society. By this same token, Dagnino (2010; 2012) states that STs are characterised by their capacity to 're-design' the usual technologies for their use in alternative contexts.

From a more critical perspective, one could argue that STs are solutions devised by vulnerable communities/groups using as a starting point their own perception of their problems and needs and having as inputs their resources and knowledge. STs are produced and reproduced with the aim of not alienating the agents involved. Thus, the production techniques are shared among producers, bringing together production and the producers' interests and stimulating communities' creativity. In this approach STs are a production and reproduction process with a focus on community associations and their ways of expression and organisation.

Other definitions of STs such as the one of the Social Technology Institute (2004) conceptualise STs as a way to legitimise the role of NGOs in adapting Information and Communication Technology (ICT) systems, allowing them to have access to its resources and put it to use in their area of activity. The Fundação Banco do Brasil (FBB), an important stakeholder in the promotion of STs in Brazil, highlights the singularity of STs in bringing together popular knowledge, social organisation and technical-scientific knowledge to generate effective solutions that are replicable at large scale.

II. Main STs Stakeholders in Brazil

The main stakeholders involved in the dissemination of STs in Brazil are policymakers from key research and Research and Development (R&D) funding institutions, civil society organisations, researchers and academia:

- FINEP (Funding Agency for Studies and Projects)

- BNDES (National Bank for Economic and Social Development)

- SEBRAE (Brazilian Support Service to Micro and Small Enterprises)

- UNESCO

- Municipalities

- FNDE (National Fund for the Development of Education) and PNAE (National School Feeding Programme)

- CONAB (National Supply Company) and PAA (Food Procurement Programme)

- NGOs such as Articulação do Semiárido Brasileiro (ASA—Brazilian Semi-Arid Adaptation Movement)

- Ministry of the Environment

- Ministry of Health

- MDS (Ministry of Social Development and Fight Against Hunger)

- FBB's Banco de Tecnologias Sociais (BTS—Social Technology Database) and Award for Social Technology.

III. Successful STs in Brazil

Two interesting examples of STs in Brazil are:

- the promotion of the home-made oral rehydratation treatment (ORT) based on sugar and salt diluted in water (*soro caseiro*) to fight dehydration and reduce child mortality; and

- the construction of pre-made cisterns that are built by communities in the semi-arid region of Brazil to attenuate the effects of the lean/dry season. Thanks to a large state network that supports and promotes these STs, many of them have influenced public policies or became a public policy themselves. The methodology of construction of pre-made cisterns in the semi-arid region is a good example of this process. For more than 10 years, ASA— a consortium of civil society organisations—has been receiving federal

government support (through the MDS under its 1 million cisterns programme, P1MC) to disseminate this methodology to minimise the worst effects of the crisis (ASA Brasil, 2014a). Other institutions such as the FBB and Petrobrás (the state oil company) also support the dissemination of this technology. In addition to access to pre-paid cisterns, there is also another innovation called P1+2 (or 'second water') in which households in the semi-arid region that already have the cisterns for drinking and cooking receive technical assistance to build reservoirs using STs to harvest and store water for vegetable gardens and small livestock (ASA Brasil, 2014b). Also in the semi-arid region, the *Água Doce* programme promotes the desalination of water for fish farming, using plants that absorb the salt and later can be used to feed goats—the most common livestock for smallholder farmers in the region (Costa, 2013).

Other examples of STs that became public policies can be found in the strategies to support family farmers and to improve food security. Two examples are Sustainable and Integrated Agricultural Production (PAIS) supported by SEBRAE, and the Food Acquisition Programme (PAA), which has been successively modified to respond to the demands of the family farmers' social movement by purchasing a minimum of 30 per cent of the total resources of the PNAE from family farmers (Costa, 2013).

IV. The Institutionalisation of STs in Brazil: The Agenda of the FBB

FBB is an important stakeholder in the identification, funding and exchange of experiences and best practices in promoting STs. Since its creation in 1985, the FBB works in the field of science and technology supporting social and research projects. In 2001 it created the BTS with a focus on investment, funding and dissemination of STs already implemented/tested which were found to be replicable and effective in addressing social problems and challenges. To assist in this process, the FBB Award for Social Technology was created in partnership with Petrobrás, BNDES, KPMG, independent auditors and UNESCO Brazil. A by-product of this award is a publicly

FINEP Programmes and Funding Lines and Their Capacity to Support STs

	Programmes with greater capacity to contribute to and promote STs	Programmes with indirect capacity to contribute to and promote STs
1	*Inovacred*	*Inova Aerodefesa*
2	Innovation in Assistive Technology	*Inova Agro*
3	*Inova* Energy	Reimbursement Funding
4	*Inova* Health	*Inova Petro*
5	*Inova* Sustainability	*Inovar*
6	*Inova* Telecommunications	Direct Investment in Innovating Firms
7	SIBRATEC	PAISS
8	TECNOVA	PAISS Agriculture
9		Economic Subvention
10		International Cooperation

Source: Authors' own elaboration using FINEP information.

available database that lists sustainable and replicable STs. In its seven editions the FBB Award for Social Technology has invested over BRL3 million in the improvement of more than 500 different initiatives listed in the BTS (Jesus and Costa, 2013). In its last edition (2013), 1011 applications were received, of which 192 were included in the database. The award comprises five distinct categories: 1) Traditional Communities, Family Farmers and Settlers of Agrarian Reform; 2) Youth; 3) Women; 4) Public Managers; and 5) Education and Research Institutions and Universities.

Since 2003, the FBB, in line with the federal government's Zero Hunger programme, has been working on the replication of STs aimed at generating employment and income in communities with a low Human Development Index.

V. The Institutionalisation of STs in Brazil: FINEP, BNDES and IPEA in the Funding of STs

FINEP is a funding institution for R&D in Brazil which recently joined forces with the BNDES and the IPEA to strengthen their agenda on STs. These first two institutions provide funds, while the IPEA devises ratings/rankings and undertakes competitiveness and sustainability studies.

Eight out of FINEP's 18 programmes and funding lines are directly related to the dissemination of STs, while the remaining lines are indirectly related. Many of these programmes make it possible for smaller firms to participate in an R&D project as 'business partners'. There are also funds for Scientific and Technological Institutions.

The *Inovacred* programme, for example, is a fund for investment in innovation that works in a decentralised fashion based on financial agents spread across the federal units. Each financial institution offers up to BRL80 million to support innovating firms. The values of the funded projects must be between BRL150,000 and BRL2 million for small to medium-sized firms (based on gross revenue) and up to BRL10 million for larger firms. This initiative offers funds with an interest rate of 3 per cent per year. For firms in the Northern and Northeastern regions, the final cost of operations is even lower (at the Long-Term Interest Rate (TJLP) less 1.5 per cent per year) and a grace period of up to 96 months.

The Innovation in Assistive Technology programme, whose budget for 2014 is BRL150 million, provides funding of amounts between BRL1 million and BRL20 million, with an interest rate of up to 4 per cent per year, a grace period of 36 months and payment deferred over 84 months. These are some of the best financing conditions precisely because of the social relevance of the technology covered by this programme, which promotes the development of technology that will help the well-being of people living with disabilities.

The *Inova* Energy programme, in turn, can accommodate STs more directly in its line dedicated to sustainable and hybrid smart grids, in which smaller initiatives may participate by partnering with larger companies. In this programme line, FINEP funds up to 90 per cent of the project value and grants a grace period of up to 36 months. For 2013-14 there has been an increase in capital of BRL200 million, which will provide an extra BRL1 billion of credit.

In the case of the *Inova* Health programme, private and state enterprises can apply for funding. The funding line N.3 is the line most directly related to STs, as it focuses on telehealth and telemedicine, particularly in relation to projects that meet the requirements of the Brazil Telehealth Network Programme, managed by the Ministry of Health. The *Inova* Health programme provides funds totalling BRL3.6 billion by December 2017. The thematic line N.5 of *Inova* Telecommunications is also related to *Inova* Health, as it focuses on the development of technological solutions dedicated to telehealth.

The *Inova* Sustainability programme offers four thematic lines with large capacity to support STs: 1) Sustainable Production; 2) Recovery of Brazilian Biomes and Fostering of Forest-Based Sustainable Productive Activities; 3) Environmental Sanitation; and 4) Environmental Monitoring and Prevention of Natural Disasters. Initiatives in this area have four instruments provided by FINEP and 11 others provided by BNDES.

The Brazilian System of Technology (SIBRATEC) is a programme with three components: Networks of Centres of Innovation (with a focus on Scientific and Technological Institutions); Networks of Technology Services (for more traditional firms); and Networks of Technological Extension (suppliers of technical assistance in the innovation process).

Finally, the TECNOVA programme promotes economic subsidies for micro and small firms. The value of the grant to be awarded to companies with FINEP resources varies between BRL120,000 and BRL400,000.

In addition to the programmes listed above, there are also other initiatives run by FINEP and its partners to intensify the dissemination of STs. As a result of the partnership between FINEP and the Ministry of Science, Technology and Innovation (MCTI) in the context of Rio +20 (2012), the Sustainable Brazil programme was created, offering BRL2 billion for the development of products, processes and innovative services linked to the concept of sustainability. Among the topics covered are smart grids, renewable/biofuels energy, energy efficiency, mobility and sustainable urban transport, reduction of the effects of climate change and pollution, sustainable production (clean technologies, ecodesign) waste recycling and environmental sanitation, construction and sustainable urban infrastructure, social technologies, biodiversity and biomes, sociobiodiversity networks, and electric vehicles and/or hybrids.

For 2013-14 a new programme named *Inova Empresa* was created whose selection criteria are based on three ratings prepared, respectively, by the IPEA, Serasa (credit rating bureau) and technology experts. These ratings are sets of indicators that support and make more transparent the selection process for projects to be supported by FINEP programmes. The rating prepared by IPEA, made up of 86 indicators, was presented at the seminar 'Social Technologies and the new *Inova Empresa* programme'. At that event the President of IPEA and Minister of SAE, Dr. Marcelo Neri, said that the challenge for IPEA and FINEP is to collaborate to disseminate STs in the country in the areas of education, health and urban mobility, and cited as an example the microcredit initiatives in the Brazilian Northeastern region, whose experience he considers STs at a large scale.

The rating prepared by IPEA includes five dimensions: economic (net revenue and number of employees); sectoral (technological intensity and investment in R&D of the sector); spending on innovation (continuous and occasional R&D); human resources allocated to and expenditures on innovation (personnel employed in R&D); and results of innovative activities (percentage of revenue from new products, and product and process innovations).

Also as part of the *Inova Empresa* programme, the FINEP Innovation Award was created, which has a specific category for STs. In 2013 the Technology Foundation of Acre (FUNTAC) was the winner. This foundation has been producing male condoms using native latex from the Amazon rainforest for the last five years. Its products are distributed to all the states in the Northern region, as well as the states of Mato Grosso, Mato Grosso do Sul and the Federal District. About BRL30 million has been invested in the project and in the factory, which produces up to 100 million condoms a year. The project strengthens the productive network of rubber, boosts the economy of the forest and generates employment and income for the rubber tree tappers.

VI. STs and the Single Registry of Targeted Social Programmes

A very important ST in Brazil is the Single Registry (*CadÚnico*), a database with socio-economic information on individuals and families living in poverty and vulnerability, which is the main tool for the design and implementation of public policies for that target group at all levels—namely, federal, state and municipality. As pointed out by Renato Veloso (2012):

> "[...] the Single Registry is a representative map of the poorest and most vulnerable families in Brazil, with a broad potential to be used by various social protection programmes [...] It serves as an important planning tool for public policies aimed at low-income families which allows the creation of indicators that reflect the various dimensions of poverty and vulnerability, through the identification and characterisation of the socially vulnerable segments of the population."

The information compiled in the Single Registry includes both data on the household (family composition, address, household characteristics, access to water, sanitation, electricity, monthly expenses and access to social programmes) and data about each of the components of the family (such as civil documentation, educational attainment, occupational status and income).

More than just a tool for compiling this information, the Single Registry is characterised as an ST because of its strategy for community and local government involvement in the collection and use of these data. The information is collected by municipalities, which receive financial incentives from the central government to perform their functions and improve the quality of the registry and the monitoring of the conditionalities of the *Bolsa Família* programme. Once collected, the information is processed by the MDS and constantly publicised through the Social Information Matrix (MIS)—an online database—and in a series of periodic publications based on specific indicators. Moreover, the department responsible for implementing *Bolsa Família* (SENARC) at the MDS provides frequent training for municipal officers, and learning and knowledge-sharing of best practices in the implementation of the Single Registry, which increases municipality capacity to plan and implement public policies aimed at fighting poverty and inequality.

According to Soares et al. (2009), one of the main characteristics of the Single Registry is precisely how its use of ICT brings together a common database to be used by several social protection programmes. According to the authors, this process was gradually built over the years, and its reach is largely associated with the unification and expansion of the *Bolsa Família* programme. According to Soares and Sátyro (2009), before the unification of conditional cash transfer (CCT) programmes in 2003 there was no way to strengthen the Single Registry, because each CCT programme was managed by a different implementing agency, through different information management systems and without much coordination between them. Through the merger of various CCTs into *Bolsa Família* in 2003 it was possible to effectively unify and expand the database of poor and vulnerable households in the country.

In any case, it must be acknowledged that although the Single Registy was expanded as a result of the *Bolsa Família* programme, and even though the Single Registry is essential for the functioning of *Bolsa Família*, its importance goes beyond that programme. The Single Registry is also a tool for targeting the following federal programmes: *Bolsa Verde*, *Minha Casa Minha Vida*, Social Tariff for Electricity, Popular Telephone, Programme for the Eradication of Child Labour (PETI), Senior Citizens Card, Water for All Programme, *PROJOVEM*, a special pension benefit for 'housewives', and Emergency Assistance for Drought. Additionally, the Single Registry is also used to target several state and local municipal programmes such as *Bolsa Carioca* (Rio de Janeiro City complementary programme to *Bolsa Família*). Moreover, the Single Registry not only includes beneficiaries of social programmes but also aims to gather information on people in vulnerable situations regardless of whether or not they are eligible for a specific social protection programme.

In 2005, with the improvement of the Single Registry management information system, this ST tool went through a cleaning process that informed the expansion of the *Bolsa Família* programme. In 2008 a new enhancement took place with the inclusion of specific information on indigenous communities, maroons and homeless people.

In 2009 version 7.0 of the Single Registry was launched in an attempt to make it more efficient. Produced using free software, version 7.0 supports data entry and data updating online (in real time), thus eliminating the need for data extraction and transmission. Additionally, the new version has initiated a national effort to empower municipal agents. This task was undertaken by a team of over 20,000 trainers, and resulted in the training of at least one agent per municipality that had already implemented version 7.0. It is worth noting, however, that not all municipalities currently operate with all the features of version 7.0, since it requires computers with a good, stable and fast internet connection.

Among the innovations brought about by version 7.0 it is worth mentioning the strengthening of the verification mechanisms for the uniqueness of the individuals in the registry. This is possible because the information goes directly and immediately to the national database, which can be accessed at any time by other municipalities. The new version also allows

municipal managers to identify in the system the families and individuals registered by other municipalities, to change the person responsible for the family in the system (the beneficiary who receives the transfer), and to cope with families moving across municipalities without losing their benefits, losing track of their information in the system, including individuals who do not have a birth certificate in the Single Registry (without assigning an ID number), and without being considered in the calculation of the per capita family income.

The Single Registry has been so successful that today it is one of the largest sources of demand for international cooperation, particularly for countries that are developing cash transfer programmes. The achievements of Brazil's social protection and food security policies have led to a major interest in sharing and adapting these experiences to other contexts. Similar interest in cooperation has also been expressed for the dissemination of the pre-made cisterns and the food acquisition programme (PAA) also discussed in this note.

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References:

ASA Brasil (2014a). 'P1MC', ASA website, <http://www.asabrasil.org.br/Portal/Informacoes.asp?COD_MENU=1150> (accessed 16 April 2014).

ASA Brasil (2014b). 'P1+2', ASA website, <http://www.asabrasil.org.br/Portal/Informacoes.asp?COD_MENU=1151> (accessed 16 April 2014).

Bava, S.C. (2004). 'Tecnologia social e desenvolvimento local', in Fundação Banco do Brasil (org.), Tecnologia social: uma estratégia para o desenvolvimento. Rio de Janeiro, Fundação Banco do Brasil.

Costa, A.B. (org.) (2013). Tecnologia Social e Políticas Públicas. São Paulo, Instituto Pólis; Brasília, Fundação Banco do Brasil.

Dagnino, R.P. (org.) (2010). 'A tecnologia social e seus desafios', Tecnologia social: ferramenta para construir outra sociedade, 2nd edition. Campinas, Komedi.

Dagnino, R.P. (org.) (2012). Tecnologia social e economia solidária: construindo pontes. Campinas, Gapi/Unicamp.

FINEP (2012). FINEP website, <http://www.finep.gov.br/> (accessed 16 April 2014).

Fraga, L. (2011). 'Autogestão e tecnologia social: utopia e engajamento', in E.A. Benini, M.S. Faria, H.T. Novaes et al. (orgs), Gestão pública e sociedade: fundamentos e políticas públicas de economia solidária, 2nd edition. São Paulo, Outras Expressões.

Fundação Banco do Brasil (undated). 'Tecnologia Social', Fundação Banco do Brasil website, <https://www.fbb.org.br/tecnologiasocial/o-que-e/tecnologia-social/> (accessed 16 April 2014).

Ministério do Desenvolvimento Social (undated). 'Cadastro Único', Ministério do Desenvolvimento Social website, <http://www.mds.gov.br/bolsafamilia/cadastrounico> (accessed 16 April 2014).

Novaes, H.T. and R.B. Dias (2010). 'Contribuições ao marco analítico-conceitual da tecnologia social', in: R.P. Dagnino (org.), Tecnologia social: ferramenta para construir outra sociedade, 2nd edition. Campinas, Komedi.

Rede de Tecnologias Sociais (undated). 'Tecnologia social: conceito', Rede de Tecnologias Sociais website, <http://www.rts.org.br/rts20/tecnologia-social/tecnologia-social> (accessed 16 April 2014).

Soares, S. et al. (209). 'Focalização e Cobertura do Programa Bolsa Família: qual o significado dos 11 milhões de famílias?', Texto para Discussão, No. 1396. Brasília, IPEA.

Soares, S. and N.O. Sátyro (2009). 'Programa Bolsa Família: desenho institucional, impactos e possibilidades futuras', Texto para Discussão, No. 1424. Brasília, IPEA.

Veloso, R. (2011). Tecnologias da Informação e Comunicação: desafios e perspectivas. São Paulo, Saraiva.

Veloso, R. (2012). A Centralidade do Cadastro Único na Proteção Social Brasileira. Brasília, Secretaria de Avaliação e Gestão da Informação, Ministério do Desenvolvimento Social e Combate à Fome, <http://aplicacoes.mds.gov.br/sagirmps/simulacao/sum_executivo/pdf/sumario_88.pdf> (accessed 16 April 2014).

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