

Social Technologies for Sustainable Development: Valuing Social Capital¹

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*"Small actions taken by each of us, multiplied across communities, can create a better world."
UN Secretary-General Ban Ki-moon²*

Social technologies are important for development. Though less frequently discussed than other forms of technology, they have proven to be critical in the way that solutions to complex development issues have been modelled and transferred. By assessing how such technologies or innovations tackle social problems that can be scaled up and transferred to other regions and local communities, much can also be learned about the value of the 'social' in direct and indirect ways for development. This Policy Research Brief looks at the role of social technologies, their evolution to date and how examples of creating social capital (through positive social interaction and the role of social entrepreneurs) can be catalytic in delivering triple policy wins for sustainable development, particularly in addressing exclusion and inequality.

I. Context for Rio+20

In preparation for the upcoming UN conference on sustainable development, leaders met in a joint conference conducted by the US Department of State and the Center for Social Innovation to discuss the role of technology transfer in development. The work and the findings of this three-day conference on the role of connection and information technology highlights the importance of discussing and mainstreaming social technologies in the 'how' of inclusive and sustainable development, which is at the centre of this year's Rio+20 conference. This complements an intensified focus by UNEP, the World Bank and others on valuing natural capital, in an effort to bridge the economy–environment nexus and to decouple growth from environmental degradation. This document emphasises both the need to maintain and create new social capital to sustain efforts, and the positive multiplier effects from socially driven sustainable development efforts.

II. Introduction

Noted economist Sir Partha Dasgupta asserts that "intergenerational well-being increases over time if and only if a comprehensive measure of wealth per capita increases" (Dasgupta, 2010). Wealth here is not defined in the narrow sense of gross domestic product (GDP) but includes natural capital (e.g. ecosystems). This ideology contradicts prevalent human-centric ideology that 'nature' can be exploited to generate infinite growth. This approach suggests instead that unless natural capital increases alongside economic (GDP per capita) and social (Human Development Index – HDI) markers, growth will still be unsustainable. This concept is further reflected in renewed efforts to expand the HDI to include equity and sustainability measurements (see UNDP, 2011), with a marked move away from an over-reliance on GDP as an adequate measure of development. The 2011 *Human Development Report* in fact demonstrated in tangible ways how growth was weakened and diminished by both inequality and unsustainability. The 'Beyond GDP' approach continues to expand and was featured significantly at the March 2012 'Planet Under Pressure' conference; the UNDP corporate side-event for Rio+20 is also anchored on this theme. Taking this approach allows us to better understand socially-inclusive sustainable development or a path towards that understanding.

Social problems require social solutions. Social science approaches (which may include programmes, methodologies and techniques which are replicable) potentially provide a linking role: in improving on the process of consultation, promoting active participation and enhancing capability and the creation and maximisation of new opportunities. Education and health are particularly important in both capability and opportunities and for agency. The World Bank (2010: 34) notes that "education will also affect a person's ability to anticipate climate events, make proactive adaptation decisions and reduce losses related to disasters." As such, the transfer of appropriate mechanisms from social policy and social development to environmental management, including climate change, particularly focused on 'social transformation' can complement structural reforms at the economic, industrial and technological levels. The concept of 'social technology' focuses largely on technologies for a social purpose or on a social basis, with reference to sustainable local development efforts which promote social inclusion, employment generation, social transformation etc. (Maciel and Fernandes, 2011; RTS, n.d).

Frequently, the discussion about technology, whether in the context of industrial transformation or of energy poverty, is largely about hardware. The role and potential of ‘social’ welfare—in other words, the software components of development—have been discussed more rarely. It has been suggested that this neglect of social technology, particularly in the public sector, results in inequitable and inefficient outcomes. As an example of how a lack of attention to social technology can result in inequitable outcomes, Caplow (1994) provides an example from the healthcare system of how the significant infusion of money into the healthcare system inflated the income of providers and profits of suppliers beyond all reason, instead of improving the quality and availability of care. This in turn gave physicians the incentive and the resources to lobby effectively against any effective limitation of medical costs. Social technology, therefore, concerns itself with regulation of the social and makes reference to standardised procedures for the organisation of social action.³

III. Constituting the ‘social’

The specificity of ‘the social’ in technology is what constitutes social technology according to Beaulieu and Derksen (2011). They further classify social technology according to three vectors:

- *The social that consists of human action* that is intrinsic to the functioning of the technology. Social technology here can be understood as the application of methods/procedures to maintain or modify the behaviour of individuals, groups of people, communities or organisations.
- *The social consisting of social interaction* on which the technology itself depends for its constitution. These are technologies intended to modulate social behaviour and in many instances are responsible for the creation of social institutions.⁴
- *The social that creates technology.* This aspect emphasises the contribution of the social sciences in training and educating graduates who then create the technology.

Impact analysis from policy innovations in Brazil, South Africa and India with expansion to Senegal (Perch, 2010) demonstrate the capacity to respond to both the dimensions of scope and scale. For example, Brazil’s National Programme of Biofuel Use and Production (PNPB) has linked small farmers to the biofuel value chain, helping both macro structural transformation and small farmer livelihoods; South Africa’s Expanded Public Works Programme (EPWP) has effectively linked guaranteed access to employment, environmental management and women’s time use; and the Barefoot College Approach has simultaneously addressed access to energy, women’s access to technology and reduced dependence on fuel-wood consumption for heating.

In the case of the latter, reducing women’s vulnerability was matched by immediate outcomes for mitigation— i.e. the reduction of emissions from fuel-wood consumption and a capacity to sustain the renewable energy technologies and infrastructure. Other examples of where a social technology approach can be extrapolated and/or has been more directly implemented with success include:

- *Ciudad Mujer*:⁵ a new initiative in El Salvador in which an integrated package of services target the multiple social needs of urban women.

- *One Earth Designs*:⁶ The organisation attempts to improve the living conditions of low-income people by adopting cleaner and more convenient technologies and thereby empowers communities to take an active role in adapting to and mitigating climate change. The design process of collaborative assessment, co-creation, realisation and evaluation is a unique social technology that is intrinsic to the creation of the technology and helps the technology to be used effectively. Based on ‘community-inspired innovations’, results such SolSource are helping Himalayan communities and making their solutions into reality.
- *Recent discussions on the role of ICT* for climate change and development by Angela Ospina (2010, 2011) to create new outputs and outcomes such as social resilience.⁷ Moreover, Biermann et al. (2010) highlight the role of knowledge, power, norms and scale in addressing challenges in earth governance systems.
- *Advances in e-participation* which also now include the concept of e-Parliaments. Expanding research on the roles of social technologies for expanded and more qualitative participation is reflected in a number of new developments including the establishment of the Centre for Digital Citizenship based at Leeds University.⁸

The creation of the Social Technology Network (RTS) in Brazil provides further evidence that social technology has definitely moved beyond the conceptual. An online portal (http://www.brasil.gov.br/sobre/science-and-technology/social-development/the-social-technology-network-rts/br_model1?set_language=en) is the hub for related efforts and includes a broad literature on the topic in both Brazil and elsewhere.

IV. Technology transfer: creation of new social capital?

While Caplow (1994) establishes the desirability of social technology transfer due to equity and efficiency reasons and establishes imitation of success as one of the primary principles of good social technology, Chatterjee (1990) looks at the study of and research in the area of social technology transfer. Chatterjee (Ibid: 11) defines technology transfer as “a process whereby technological material, information or capabilities developed originally for one culture or setting are used in another for the same general purpose for which they were developed”. One critical value of social technology to development, potentially, is its ability to both leverage existing social capital and also to create new forms of social and human capital.

This is particularly important for Africa and Asia, where rural poverty remains highly entrenched, where social indicators of development, in some cases, remain weak, and where creating and accumulating human capital remains a significant barrier to development. For Africa, this remains a significant barrier to innovation and transformation.⁹

The Institute of Community Cohesion defines social capital as “the social glue that helps people, organizations and communities work together towards shared goals”. It comes from everyday contact between people, as a result of their forming social connections and networks based on trust, shared values, and give and take. Research conducted by

the Young Foundation has observed a link between higher levels of social capital in communities with improved health and higher achievements in education among local residents. A possible explanation is that greater social capital leads to more robust informal networks among residence of a community (Hothi, 2008). These informal networks might manifest themselves as child care provision, looking after an elderly neighbour or helping to find housing through word of mouth.

Social technology transfer is potentially both a formal and informal network between problems and solutions as well as between producer and possible consumer. This is already happening in the context of South-South Cooperation, through which countries share approaches and techniques such as conditional cash transfer models as well as monitoring and management approaches like a single-registry system. Social protection models, for example, are already working in similar ways to reduce both poverty and inequality and to promote social and productive inclusion. Adapting such innovations and solutions can potentially be useful in mitigating social risk (by reducing sensitivity, alleviating poverty and lowering inequality) and help to increase adaptive capacity to climate variability and change.

As South-South Cooperation (SSC) expands as a model of development collaboration and as a new space for the exchange of technology, financing and other transfers, it potentially shifts 'development finance' from the traditional 'donor-receiver relationship' to one which is more "a handshake...built on partnership," as described by UNDP's Ajay Chhibber,¹⁰ Assistant Secretary-General and Director of the Regional Bureau for Asia and the Pacific. This means that social technologies in the form of the models for addressing poverty and inequality can be shared and transferred to countries across Africa, for example, and in turn Africa can also contribute to development models in other regions.

Chatterjee (1990) notes, however, that any transfer of social technology must take into account and reconcile issues of adaptability and replicability. He concludes that the transferability of social technology from one context to another is easy and complete when there is similarity between the two. Current models of SSC seem to meet these requirements. The Government of Brazil's approach is anchored largely on two key areas of intervention—the agricultural sector and social protection/social policy. This model is based largely on transferring proven approaches and methodologies to resolve similar issues of complexity (i.e. poverty reduction and reduction of social inequality). Largely deployed in Africa, this has already resulted in a number of positive outcomes.

The funds provided by Brazil for international development cooperation are estimated to have increased by 129 per cent between 2005 and 2009, from US\$158 million to US\$362 million, according to the first official report on Brazilian international development cooperation (Osava, 2011), and the following technologies have already been deployed in several poor developing nations:

- The breast milk bank network, which has proven effective in lowering infant mortality, is being employed in Angola, Cape Verde and Mozambique.

- Expertise in tropical agriculture from the Brazilian Agricultural Research Organisation (EMBRAPA) is helping to achieve higher yields and quality of cotton in the four big producers of that crop in Africa: Benin, Burkina Faso, Chad and Mali.
- Health and vocational training programmes are contributing to the response to HIV and AIDS (Ibid).

Considering the devastating impact of poor health service provision, limited irrigation capacity, creeping climate change and HIV and AIDS on Africa's development, to the cost of billions of dollars per annum in losses, the value of the programmes mentioned above is immediately recognisable. It is not yet possible to adequately measure and define the true development impact of these initiatives, but they do present a significant advance in being able to match more directly solutions to problems and to eliminate the costs and burden of policy experimentation, testing and evaluation before significant policy reforms can be applied.

Even without quantitative analysis, one can see where this potential creates catalytic reactions within society and numerous benefits in terms of health capital, education capital and potentially new labour capital. It has been estimated that ill-health, low education outcomes and other indirect externalities such as climate change can significantly reduce productivity. This is visible in the impact of conflict on development in Africa, in the billion dollar annual costs of malaria, the million dollar annual cost of poor sanitation and the short- and long-term impact of malnutrition on Africa's development.

Such broad engagement on South-South Cooperation within the India-Brazil-South Africa (IBSA) Dialogue Forum is based dually on a framework of a new politics of development cooperation, which is South-driven, and on a number of commonalities between the main protagonists.

South Africa potentially provides many home-grown ideas to its neighbours and key support in defining applicability in translating lessons and practice from other regions; Brazil's social make-up, history and language allow it to deliver specific assistance to several Portuguese-speaking countries and territories in Africa (at least five); and India's participation in the Commonwealth leverages shared colonial pasts, common administrative systems, language, systems and successes in technology to accelerate such transfers. Still, recent discussions on SSC in the agriculture sector, suggest caution in the wholesale transfer of technology from one environment to another. For more on the latter, see <<http://www.ipc-undp.org/pub/IPCPovertyInFocus24.pdf>>.

IV. Emerging technologies that expand and create new forms of social capital

The second form of the social discussed by Beaulieu and Derksen (2011) is social interaction. In terms of technology, these are those that depend on social interaction for their foundation and in some circumstances act to transform sociality in the environments in which they operate and are applied. In some cases they may also be responsible for the creation of new social institutions. Such technologies should also include lessons on participatory engagement from the

sustainable agriculture and rural development approach of the UN Food and Agriculture Organization (FAO)¹¹ and the participatory research methods of the Consultative Group on International Agricultural Research (CGIAR).¹²

The formation of stronger social capital lies in people's ability to successfully apply the two concepts of bridging and bonding. Bridging refers to the networks formed among people possessing diverse social characteristics. Bonding refers to the building of social networks among people from a similar demographic or social group. Both are required to create societies with strong levels of social capital. Social capital, when combined with what Robert Sampson terms 'collective efficacy'¹³ (the willingness of a particular group of citizens to solve a certain problem or social issue) can result in innovation or new technology.

When social technology is used to bring about behaviour change, it can do so directly or indirectly. Chatterjee (1990) delves into the behaviour change issue by attempting to understand determinants of action and thought. Behaviour change is one example of the formation of social capital, often by changing negatives into positives. Other successful social capital creation technologies include:

- social technologies that are based on imitation of successful projects, since they come pre-equipped with the necessary parts of an operational social system: norms, values, attitudes, tables of organisation, division of labour, status ladders, roles and role models, measures of input and output, performance criteria, legal rights and obligations and built-in appropriate incentives. Models that have been widely imitated have survived a long-term process of selection that eliminates ineffective or unstable design;
- social technologies that are based on relevant findings of social research: any proposed programme should be reviewed to determine whether the intended effects seem credible in the light of what is known about human behaviour in general and the activities and relationships particular to that system; and
- social technologies that follow an operational sequence rather than a single act: starting with goals that are clearly specified, feedback mechanisms for continuous monitoring, mid-course corrections and a commitment to trial and error.

Given the increasing attention to appropriate frameworks which define and guarantee rights, to institutional frameworks, to the green economy and to justice and equity, this clearly defined role for social technologies is highly relevant.

V. Processes and actors required for scaling up and disseminating social technology: joining the dots

There is also an important component of dissemination and upscaling related to social technology (Latour, 1994) which is very relevant for development policy. In addition to learning from the past, there is an important role for social technology in framing future actions. By creating social technology, new institutions will form, encompassing new modes of interaction such as the development of new markets, laws, organisations and various forms of collective action. The broader discussions on institutional frameworks

for sustainable development (IFSD) also reflect similar actions and processes. For example, on the issue of climate change, efforts to reverse current patterns of catastrophic change are needed at both the local and global levels and in concert with each other. In such a way, social technology may then play a dual role—by creating immediate forms of capital and also leading to other forms through replication and reproduction. This dual role is captured by the Rede da Tecnologia Social (RTS) in Brazil, in defining social technology beyond its efficiency in solving social challenges and highlighting the importance of replicability (Aldalice Otterloo, et al. 2009).

Such reproduction can be shaped by 'cross-pollination'—i.e. disseminating instances of social innovation through the horizontal spread of social technology and upscaling through vertical processes. Similarly, in policy and development practice, there is a need for both cross-scaling (mainstreaming) and upscaling—in other words, policy convergence and policy coherence. To create successful cross-pollination, NESTA, a UK-based organisation promoting social innovation, identifies two components imperative to its success: 'bees' and 'trees'. Bees are small organisations, individuals or groups that possess characteristics of being quick, mobile, having new ideas and the ability to locate receptive 'trees'. Trees are large organisations that, while being relatively poor at creativity or generating innovative ideas, are, however, good at implementing new projects or concepts and possess proper resilience, roots and large enough scale to put social innovation and technology into action.

Typical examples of trees are governments, private companies or large non-governmental organisations (NGOs). It is the interaction and cooperation between these two groups through horizontal action (from bees) and vertical upscaling of ideas (by trees) that elements of social technology or social innovation can grow and spread. Parallels can be drawn to micro and macro policy frameworks and their differing and complementary roles and the important value of change at the local (Barefoot College Approach) and national levels (Brazil's PNPB), both referred to previously.

Individuals that carry out similar processes to bees in cross-pollination are more commonly known as 'social entrepreneurs'. The OECD defines these as: "men and women who mobilize citizens; find uses for technology to respond to concrete needs; collaborate with public institutions and shift political systems to create the right conditions for change; engage businesses and private investors in distributing their innovations; and work with researchers to prove and document their findings."¹⁴ Social entrepreneurs can, in particular, be useful in cases where various interests are present and may conflict. The diverse interests and objectives of various stakeholders can impede the progress and forward momentum of social technologies from being disseminated, scaled up or even getting off the ground. Social entrepreneurs may also simply be necessary to link groups or individuals where various stakeholders are working separately and could benefit from knowledge-sharing between individuals and groups (OECD, 2011). A well-known example of a social entrepreneur

is Muhammad Yunus, who founded the Grameen Bank, which provides microcredit loans to individuals with no formal form of collateral. The success of the Grameen Bank's approach and the more recent evolution of Grameen Shakti, which links rural energy-poor communities to renewable energy options through microcredit, also highlights the potential upscaling of the 'socio-economic' to the 'socio-economic-environmental'. Social entrepreneurs are thus often pivotal in 'joining the dots' between the social, economic and environmental pillars of development.

Soccket,¹⁵ a product from Uncharted Play Inc., is an example of a social technology that directly targets multiple benefits—in this case, energy efficiency, impacts on the environment and social issues within households and communities. Its primary outcome has been to shift negative environmental and health-related methods of light energy to more environmentally and health-friendly forms of power. This has been achieved by simply playing with the ball to power an LED light. An emerging partnership discussion with Promundo, an NGO founded in Rio de Janeiro, represents a potential expansion of its social focus as well as upscaling. Promundo has been working in Morro dos Prazeres for many years in programming and research, including soccer (or football) or sports as a space for dialogue to address gender inequality and to end the violence faced by women, children and youth. The partnership seeks to cross-pollinate through the Soccket technology by "linking clean energy, social inclusion and public-private sector partnership".¹⁶

Accordingly, social entrepreneurs and the process of cross-pollination reinforce the idea that with social technology, as compared to physical technology, the community and individuals occupy the role of protagonists in social technology transfer and are not merely technology receivers (Rodrigues and Berbieri, 2008). According to SDinet:¹⁷ "community-to-community exchanges allow participants to see themselves and their peers as experts, thereby breaking isolation to create a unified voice of the urban poor, reclaiming sites of knowledge that have frequently been co-opted by professionals, and strengthening solidarity to increase critical mass." Equally, when communities have greater influence and ownership over processes of social technology and dissemination, there is a greater chance that such changes will be sustainable and continue to grow over time. Thus, they enable empowerment and active participation.

These 'solidarity' benefits of social capital are captured in both a broader macro-economic approach in Brazil called the Solidarity Economy¹⁸ as well as in a Women's Network for the Solidarity Economy,¹⁹ which connects rural women in the semi-arid regions with women in cities, blending knowledge-sharing, product development and commercialisation, income-generation and environmental sustainability. Such networks are potentially pivotal in a greening economy.

VII. Conclusion

Social technology is a powerful tool. It holds significant potential for moving beyond the stalemates and false dichotomies between the three pillars of sustainable development and the forced choices between one or the

other. They expand options not only for reversing negative trends but at the same time by creating new forms of capital. Efforts to promote equality and social inclusion can deliver beyond the micro scale and, through technology transfer, can create exponential effects both within and between countries. Social technology's capacity to value and create social capital also allows for practical and tangible ways for social policy, social well-being and good social practice to be effectively leveraged to reduce impacts both on and from the environment.

The increasing recognition of the value of social science, social research and social dimensions in environmental policy is and has been an important step forward. So, too has the recognition of the role of social innovations and increasing documentation of their development, implementation and impact. Research, debate, policy and action on socially inclusive or equitable development and socially inclusive sustainable development also enhance the recognition of and value assigned to alternative forms of capital, knowledge as capital, and knowledge transfer including potential benefits, outputs and outcomes.

Whether it is in the context of climate change or, more broadly, sustainable development, the opportunity exists to harness 'soft' technologies in significant ways to ensure that we not only avoid catastrophic change but create new positive futures for all. ■

1. This paper was kindly peer reviewed by Tricia Hackett, Senior Associate of Communities and Housing, The Young Foundation.
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6. See: <www.oneearthdesigns.com/>.
7. See: <<http://niccd.wordpress.com/>>.
8. See: <<http://ics.leeds.ac.uk/research/research-centres/centre-for-digital-citizenship/>>.
9. See: <[Mhttp://www.afdb.org/en/news-and-events/article/human-capital-critical-to-africas-structural-transformation-8477/](http://www.afdb.org/en/news-and-events/article/human-capital-critical-to-africas-structural-transformation-8477/)>.
10. See: <http://www.chinadaily.com.cn/cndy/2011-01/11/content_11823090.htm>.
11. See: <http://www.fao.org/sard/common/ecg/2460/en/SARD_Brief_2.pdf>.
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16. Special acknowledgement to Mary E. Robbins, independent development consultant, for consolidation of information related to Promundo.
17. SDinet (www.sdinet.org) is a network of community-based organisations working in Africa, Asia and Latin America to serve poor people in urban areas.
18. See: <<http://www.fiess2011.org/en/first-system-of-equitable-and-solidarity-trade-in-the-world-brazil-2010>>.
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The views expressed in this brief are the authors' and not necessarily those of the Government of Brazil or the United Nations Development Programme.



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