



This work is licensed under
a Creative Commons Attribution-Non Commercial-
ShareAlike 4.0 International License.

THE THIRD SECTOR AS A VECTOR TO FOSTER DISTRIBUTED DESIGN AND DISTRIBUTED ECONOMY INITIATIVES: A CASE STUDY OF INCLUSIVE, ETHICAL AND SUSTAINABLE SOCIAL DEVELOPMENT IN EMERGING ECONOMIES

Priscilla Ramalho Lepre

Federal University of Alagoas, UFAL. cillaramalho@gmail.com

Leonardo Castillo

Federal University of Pernambuco, UFPE. leonardo.castillo@ufpe.br

ABSTRACT

Access to water and electricity is far from being a reality in some Brazilian regions. For instance, in the Northeast region, one of the poorest in the country, many communities still live in the dark and distant from sources of drinking water, which impacts negatively in their development and wellbeing. In this scenario, government actions are not always sufficient or efficient to meet the population demands. In order to reverse this situation, many OSCIP - Civil Society Organization of Public Interest, promote social quality life inclusion and improvement of those communities through finding, deploying and implementing water and energy solutions at short, medium and long term, with the aid of national and international funds. This article presents actions developed in the last 20 years by Instituto Eco Engenho, an OSCIP that contributed effectively with simple and effective solutions for electricity and water supply, allowing the advancement of the digital inclusion and income generation for population living in remote areas at Semi-arid region.

Key Words: Distributed Design; Distributed Energy, Third Sector, Emerging Countries

1. INTRODUCTION

One major issue attached to the transition towards a sustainable society is that of improving social equity and cohesion in low and middle-income contexts, while empowering locally-based enterprises and initiatives, for an environmentally sustainable re-globalisation process characterised by a democratisation of access to resources, goods and services (LeNSin, 2016).

Design is a powerful tool to generate alternatives and promote deep social changes. Their various approaches allow you to deal from specific problems to wicked problems, such as those that maintains the unsustainability of human interfaces with their equal and with the environment. The constant process of enlarging the scope of design action, walk with the understanding and search for partnerships with other areas of the theoretical-practical knowledge and the diversity of social actors capable of contributed to the solution of current problems and restrict its future effects. Distributed Economy is one of the design recently investigate fields (Johansson et al, 2005).

The model Distributed Economy promotes small-scale, flexible networks of local socioeconomic actors, using local resources according to local needs, in the spirit of sustainable development (Johansson et al, 2005). According to the author, the centralized model and massive production presents, among other negative effects, the increase of the vulnerability and inflexibility of companies, the greater amount of environmental problems, distancing between manufacturer and consumer and mental and cultural impoverishment resulting from a centralized creation of values. In the Distributed Economy “the global is a ‘network of locations’ that is, a mesh of local systems connected, whose small scale makes it understandable and controllable by individuals and communities” (Manzini, 2010 p.8). The ‘local networks’ model appears in the design literature under synonyms such as: Regional Economy (Johansson et al, 2005), Territory Design (Krucken, 2009; Jègou, 2014) and SLOC - Small, Local, Open and Connected (Manzini, 2010). In all cases benefits of decentralization are assumed, both in relation to environmental issues as the equitable distribution of income. In this sense, Distributed Economy appears as a viable alternative to the centralized economy system (Ceschin, 2015). The following section presents the basic guidelines of the Distributed Economy design and distributed.

2. DISTRIBUTED: ECONOMY AND DESIGN

The format proposed by the Distributed Economy can be a promising path for sustainable development by simultaneously promoting economic growth, respect for the limits of nature and social ethics. According to Manzini (2010 p.8), the mesh of local systems connected in small scale, becomes understandable and controllable by individuals and communities. This is because infrastructure and critical systems are close to resources and demand / utilization points, as well as because the users themselves are producers, whether individuals, small enterprises or local communities (Manzini, 2015; LeNSin, 2016). By its structure and composition, the DE consents in the establishment of new relations between organizational centres and peripheries, allowing more autonomy and the creation of products and customized services, where and when needed (Manzini, 2015; Lepre & Perez, in press).

The DE model, therefore, subverts the status quo of the current production-consumption system, opening space for evolutions and revolutions at societies relations with the environment, economy and in their own social relations. This indicates that the adoption of the Distributed Economy model, through inclusive planning and openness for feedback evaluation, is efficient and effective as a platform for solutions to the complex problems that hamper the required balance of Sustainable Development. The adoption of distributed systems is therefore intimately linked to social issues, and it is necessary to consider the social fabric in which such a system will be implemented, since this implementation requires systemic change in socio-technical and cultural terms (Lepre; Perez, in press). Some examples that can be cited are the need to establish new forms of engagement with users and new work and employment emerging relationships (Manzini, 2015).

The Distributed Economy, therefore, implies the construction of new social relations, allowing the active participation of the people from a determined community in issues that are pertinent to them. According to LeNSin (2016), Distributed Economies (DE) offers communities and users direct access to resources, allowing them to participate in the extraction, production, distribution and use processes as well as increasing the responsibility for the alternatives used at the end of the life. This represents an opportunity for real inclusion and promote the locally-based socio-ethical benefits: empower individuals and local communities; democratize the access to resources, reduce poverty and inequality.

In addition, distributed-type solutions that emerge from local demands, to address local issues, with local resources, within local socio-economic-environmental and cultural perspectives, can be expected to contribute to reduce the imposition and transfer of exogenous solutions, often incompatible with local reality. From this point of view, it is correct to assert that the DE groups at the same model, the provision of sustainable benefits such as: a) social equity - democratizing the access to goods and services, increasing participation and training for local economies and communities; b) economic development - reducing transportation, interposing and crossing, increasing reliability; c) environmental relations - with efficiency gains, reduced transport, reduced emissions and etc (LeNSin, 2016).

Because it is a promising approach in breaking the paradigms of sustainability, design has been investigating the application from existing solutions that allow it to infer its effectiveness and efficiency. The actions found are classified as (Ibidem): Distributed Renewable Energy (DRE), e.g. mini-grid small scale renewable energy generation

plant; Distributed production of (hardware) Products (DP), e.g. 3-D Printing, Arduino; Distributed production of Software (DS), e.g. Linux; Distributed production of Information/knowledge (DI), e.g. Wikipedia, LeNS; Distributed Design (DD), e.g. open innovation/design and crowd-source/design.

According to LeNSin (2016) the definition of Distributed Design can be understood as “an open design project where small-scale design unit (e.g. one person/computer), whether individuals, small businesses and/or local communities, are connected to others. If the small-scale production units are also connected to other DE (for example, to share the energy surplus), they become a Local DE Network, which may in turn relate to nearby similar networks.” By this definition, it is understood that Distributed Design is, intrinsically, a systemic approach and, as such, according to Tamborrini (2017, p.49), it should adopt systemic approaches to innovation, among which: identifying and activating potentialities in a territory for the transformation of existing resources - such as heritage, infrastructure, economic aspects, human, cognitive and cultural characteristics - into a broad system of relationships. Thus, the action triggers a continuous and constructive process of collaboration that can provide a complete view of the investigated phenomena complexity, creating a common language for the different knowledge gathered in the innovative solution of the problem (Ibidem, p.53).

In emerging, broad and plural countries, such as Brazil, which require approaches that can generate solutions for local and highly differentiated demands, the DE model and the DD can bring benefits by generating, promoting and maintaining flexible, inclusive and self-regulatory structures, long-term, within the win-win perspective, considered the ideal for socio-ethical sustainable development. In this scenario, government actions are not always sufficient or efficient enough to meet the population demands.

On contributing to the evolution of this knowledge to be applied in low and middle-income contexts, the next section describes the work of OSCIP Eco-Engenho, which in the last 20 years used distributed and systemic economy model to improve the quality of life for population in areas of extreme poverty at northeastern Brazil. Considering this experience, it is possible to guide distributed design actions applied to high complexity and vulnerability situations and problems.

3. NORTHEAST BRAZIL - A VULNERABLE AND COMPLEX REGION

Brazil is a plural country for its vast territory and its problems. While most southern and southeastern regions benefit from good infrastructure, economic and social development, the northern and northeastern regions suffer from high inequality, income concentration and misery. At Northeast region, many communities still live without light and distant from sources of drinking water, which negatively impacts their development and wellbeing. The state of Alagoas is the second smallest in area in the country and at about 22.5% is considered affected by desertification (IBGE, 2018), meaning reduction or loss of economic and biological productivity of dry ecosystems. Although the state has improved its position in the states ranking of competitiveness (2018), the social sustainability pillar points to the extreme vulnerability of most of its population. Between the most relevant issues, there are the access to water, food and energy, which are basic living conditions. In this scenario, government actions are not always sufficient neither efficient to meet the population demands.

In order to reverse this situation, many OSCIP-Civil Society Organization of Public Interest, promotes social inclusion and quality improvement of life for those communities through finding, deploying and implementing water and energy solutions in short, medium and long terms, with the aid of national and international funds. “OSCIP is a title provided by the Ministry of Justice in Brazil, whose purpose is to facilitate the emergence of partnerships and agreements with all levels of government and public agencies (federal, state and municipal) and allows donations made by companies can be discounted in the income tax.” (Xavier, 2008, p.168)

In complex and unequal societies, such as the Brazilian one, where public power actions are essential but insufficient to promote social development and reduce disparities, OSCIP is a vehicle that allows the public power to share with civil society the task of supervising the flow of public resources, through partnerships between civil society organization and public power, dividing and allowing the disposal of public resources and also the administrative burden and accountability.

Not every civil association is framed as OSCIP. To be considered legally an OSCIP, the entity must be linked to: social assistance promotion; culture, defense and conservation of historical and artistic heritage; free education and free health; promotion of food and nutritional security; defense, preservation, conservation of the environment and promotion on sustainable development; volunteering promotion; nonprofit experimentation of new socio-productive models and alternative systems of production, trade, employment and credit; established rights promotion, construction of new rights and free legal advice of additional interest; promotion of ethics, peace, citizenship, human rights, democracy and other universal values; studies and research, development of alternative technologies, production and dissemination of information and technical and scientific knowledge related to the activities mentioned above. Thus, as suggested by De Sampaio et al. (2018), the promotion of these OSCIP's categories generate concrete interfaces between complex problems related, amid others, to the Millennium Development Goals and the human and financial resources to develop, offer and manage possible solutions, complementing the actions of the state, supplying its restrictions and promoting actions in places where it operates. These non-governmental organizations from the third sector accept the challenge and responsibility to act in the name and in the public interest for

complex causes such as social and environmental, which require, among other things, lasting involvement, closeness and constant collaboration.

3.1 Distributed Energy – Case OSCIP Eco-Engenho

Electric energy in Brazil during the last century, has been produced centrally or decentralized in large plants, whose main matrix is water strength. This system, although efficient, is fragile and does not meet the demands of the whole national territory, due to the restrictions, mainly, in the cost of implementing the necessary equipment. Thus, the investment in smaller solutions, with local and distributed generation, respecting the matrix available in each territory and its socio-economic-environmental specificities, are presented as a plausible solution.

The private generation of electric energy has been adopted by several society sectors as an alternative to reduce, at the same time, the overload of the official system and the costs of this input. In this context, wind generation, biomass and solar energy have been explored. The latter with great capacity for decentralization due to the technology employed. The Sole Matrix has been adopted to promote sustainable and socio-ethical development by serving populations outside conventional energy distribution networks, representing a real social revolution for those who are not served by the conventional system (Nascimento, 2017). A success case to illustrate this transformation can be found in the backlands of Alagoas, which, despite having the hydroelectric power plants of the São Francisco and Xingó Rivers in their territory, can not supply electricity from these semi-arid region communities (Santos, 2002).

The Eco-Engenho Institute, OSCIP based in Maceió, in partnership with Banco do Nordeste, has established the “Luz do Sol” program, which provides a credit line to finance small entrepreneurs who develop solar home systems businesses in small villages. The user must pay service fee to the entrepreneurs. Around 2,700 systems were installed, since 1992, under the program by 90 microentrepreneurs, benefiting 13,500 people (B-REED, 2005). The program works in the form of Sustainable Product-Service System - S.PSS for Distributed Economies, involving the training of local microentrepreneurs offering the product (photovoltaic panels and electrical installation kits) and technical assistance service. It allows them to maintain close contact with consumers, favoring the feedbacks (Figure 1). The Luz do Sol Project exists since 1996 and its success has been deployed in other programs and stimulated local development (B-REED, 2005). The installation of photovoltaic energy kits in 336 schools, with the Project Electrification of Schools was the starting point for the Digital Inclusion Project that serves rural schools (IEE, 2017). The introduction of electric power made possible to approach another serious problem inside Alagoas: the chronic lack of water. In this scenario, Eco Engenho works with the H2Sol Project (IEE, 2017), which uses photovoltaic energy to pump water from the subsoil and desalinizes it, providing potable water to the population.



[Figure 1] H2Sun Project. (Font: BB, 2009)

The desalter device design (Figure 2) was created within the guidelines of the distributed design, using low cost raw material and facilitated access to the site. Its construction, which requires the participation of the user allowing interferences, adaptations and feedbacks to the IEE, is guided by manual in the form of a primer, using language appropriate to the target audience, with drawings and few written sentences, as shown in Figure 6.



[Figure 2] Desalter Project and solution. (Font: IIE, 2018)

Access to water sources, in addition to improving their quality of life, has positively interfered with the structure and has allowed residents to organize themselves into cooperatives within the spirit of the distributed economy for planting, processing and marketing of food products. The projects “Aroeira” and “Pimentas da Tapera” (IEE, 2017), as shown in Figure 3, are the results of these actions, both involving the application of the Distributed Economy concept for local production and taking advantage of local resources, respecting the environment and involving society as producer and manager, promoting the socio-ethical development.



[Figure 3] Pimenta da Tapera Project. (Font: IIE, 2018)

The Pimenta da Tapera project is pointed to women, aimed at social inclusion and the reduction of gender inequality, which is very strong in the location. The choice of pepper (pimenta) as a source of income is, according to IEE, the understanding that the product, within that specific reality, could not be the same as subsistence, because extreme poverty would cause a large volume of domestic consumption making it difficult to sell surplus. With this, the author tried to avoid both the consumption of the production by the community itself and the replication of productions of neighboring communities, generating exclusive products that at the same time meet the demands of the region. Pepper blends were created expanding the variety of products and marketing possibilities. The choice of packaging was made in a participatory manner, as well as the design of the labels, which carry some women images, generating identity, empowerment and symbolic belonging to their place of origin.

The peppers produced by the community of São José da Tapera are made directly in grocery chains, restaurants, hotels and souvenir shops, mainly in the capital, Maceió, and have enabled effective socioeconomic growth, as well as reducing desertification processes inside Alagoas state. The expansion of the distributed cooperation network occurs with the union of merchants and buyers, in complementary activities and a collective construction of sustainable and equitable values. In addition, it has strengthened the local culture and avoided exodus to the larger cities, which tends to lead to marginalization and all kinds of exclusion.

4. CONCLUSION

This paper presented the Distributed Economics-DE and Distributed Design-DD models as effective systemic approaches to solving problems caused by the centralized economic model, among which are those that maintain the sustainability paradigm. In order to illustrate its potential, the systemic actions developed over the last 20 years by the Eco Engenho Institute was presented, which, through Distributed Economics and Design, has cascade generated simple and efficient solutions for access to electricity and drinking water in communities of remote and neglected areas of the Brazilian backwoods. In the light of the theory and from the assessment of the case, it is concluded that: distributed models are valid to promote the socioeconomic development of vulnerable regions; the use of clean technologies, based on resources of the territory, are effective in solving local demands when they can not be contemplated by conventional and centralized forms; that OSCIP's participation in the process of social inclusion is fundamental in emerging and plural countries, such as Brazil, in which government actions and traditional models do not address multiple regional realities and singularities; that DE and DD models promote the creation of flexible and dynamic local networks, which make communities more resilient; that in situations of extreme resource constraints (tangible and intangible), actions coordinated systemically in the form of DE and DD and aligned with the local and with territory, have a high probability of fomenting income generation, improving the quality of life and promoting income generation; that the solution of highly complex problems, such as those faced by the Brazilian semi-arid region, requires systemic projects in the short, medium and long term and that OSCIP can represent a bridge between local needs and other spheres interested in solving problems. In this way, it is concluded, finally, that the Third Sector is a relevant vector to foster Distributed Design and Distributed Economy initiatives, addressing ethical and sustainable social development in emerging economies.

BIBLIOGRAPHY

1. BB – Fundação Banco do Brasil, (2009). *Banco de Tecnologias Sociais: H2Sol, Água Solar*. Retrieved from: <http://tecnologiasocial.fbb.org.br/tecnologiasocial/banco-de-tecnologias-sociais/pesquisar-tecnologias/h2sol-agua-solar.htm>
2. B-REED - Brazil Rural Energy Enterprise Development, (2005). *Desenvolvimento de Empresas de Energia Rural no Brasil. Fundação das Nações Unidas*. Retrieved from: <http://www.b-reed.org/Portugues/>.
3. De Sampaio, Cláudio P. et al. (2018). *Design para a sustentabilidade: dimensão ambiental*. Curitiba: Insight.
4. IEE - Instituto Eco-Engenho, (2017). *Projetos*. Retrieved from: <https://www.ecoengenho.org.br/projetos/>.
5. International Institute for Industrial Environmental Economics (IIIEE), (2009). *The Future is distributed: a vision of sustainable economies*. Lund: IIIEE.
6. Jègou, F. et al. (2014). *PSS Toolkit – Development of innovative business models for product-service systems in an urban context of sustainable transition*. Brussels: IBGEBIM.
7. Johansson, A., Kisch, P., Mirata, M. (2005). *Distributed economies – A new engine for innovation*. *Journal of Cleaner Production* 13(10-11):971-979, July.
8. Krucken, Lia, (2009) *Design e Território - Valorização de identidades e produtos locais*. São Paulo: Nobel, 2009.
9. LeNSin – International Learning Network on Sustainability. *The LeNSin research hypothesis: the design of S.PSS applied to*

DE: win-win offer model for a sustainable development for all. Milão: Politecnico di Milano - Design.

10. Lepre, P. R., Perez, I. U. (in press). *Estimulando a Economia Distribuída*. In Design para a Sustentabilidade: dimensão ambiental. Curitiba: Insight.
11. Manzini, E. (2010). *Small, local, open and connected: design for social innovation and sustainability*. The Journal of Design Strategies - Change Design. Vol. 4, No. 1, Spring.
12. Manzini, E. *Design, when everybody designs: an introduction to design for social innovation*. COAD, R. Massachusetts: MIT Press.
13. Santos, Rosana Rodrigues dos. (2002). *Procedimento para Eletrificação Fotovoltáica no Brasil: uma contribuição a partir de observação de campo*. Thesis presented Interunidade de Pós-Graduação em Energia – USP. Retrieved from: <https://bit.ly/2IKVGnW>.
14. Tamborrini, P. (2017). *Sustainable and Collaborative Innovation for the Territory*. In: Barbero, S. Retrace + Systemic Design Method Guide for Policymaking: A Circular Europe on the Way. EU: Allemandi.
15. Vezzoli C. et al (2014). *Product-Service System Design for Sustainability*, London: Greenleaf Publishing.
16. Xavier, Carlos Magno Da Silva – SUP, (2008), *Metodologia de Gerenciamento de Projetos no Terceiro Setor - uma estratégia para a condução de projetos*. Brasília: Brasport.