



UNIVERSITY OF LEEDS

This is a repository copy of *Brazilian Observatory for inclusive and solidary recycling*.

White Rose Research Online URL for this paper:

<http://eprints.whiterose.ac.uk/150280/>

Version: Accepted Version

Proceedings Paper:

Rutkowski, EW, Rutkowski, JE orcid.org/0000-0001-7710-2994, Lima, FPA et al. (3 more authors) (2017) Brazilian Observatory for inclusive and solidary recycling. In: Proceedings of ATHENS 2017 Conference. 5th International Conference on Sustainable Solid Waste Management, 21-24 Jun 2017, Athens, Greece. .

This is an author produced version of a paper published in Proceedings of ATHENS 2017 Conference.

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

BRAZILIAN OBSERVATORY FOR INCLUSIVE AND SOLIDARY RECYCLING

Emília W. Rutkowski¹ Jacqueline E. Rutkowski², Francisco de P. A. Lima³, Fabiana G. Oliveira⁴, Luiz H. Silva⁵, Luciano M. Silva⁶

¹Dr Arch and Urb, FLUXUS laboratory, Department of Sanitation and Environment, State University of Campinas, Campinas, São Paulo, 13.083-889, Brasil

²Dr Eng, SUSTENTAR Institute of Sustainability Studies and Research, Brumadinho, MG, 35.460-000, Brasil

³Dr Eng, Department of Production Engineering, Federal University of Minas Gerais, Belo Horizonte, Minas Gerais, 31.270-901, Brazil

⁴Dr Eng, Nenuca Institute of Sustainable Development, Belo Horizonte, MG, 30.535-500, Brasil

⁵Waste Picker, MNCR (WP National Movement)/ASMARE, Belo Horizonte, MG, 30110.072, Brasil

⁶ Journalist, Nenuca Institute of Sustainable Development, Belo Horizonte, MG, 30.535-500, Brasil

Presenting author email: emilia@fec.unicamp.br

Keywords: waste pickers, social network, research network, action-research methodology

ABSTRACTS

In 2007, the National Sanitation Policy recognizes waste pickers as agents of the sanitation system and the 2010 National Solid Waste Policy details the role of these agents. In this process a diverse set of researchers — academics, technicians, public managers, WPs — felt the need for a space for reflection and discussion on actions to promote the inclusion of waste pickers on solid waste management systems, organizing an inclusive and solidary waste recycling. The Observatory for Inclusive and Solidarity Recycling (ORIS) was constituted in 2012. It is organized at a turning point in the WP history, when large-scale challenges arise, given the complexity of the urban waste issues and the economic interests that surround it. This paper focuses on ORIS contribution for Brazilian inclusive and solidary recycling scenario. In order to consider recycling as a socio-technical alternative into the integrated urban waste management systems (IWMS) that has been design on the State and Municipal Solid Residues Planes, it is fundamental not only a coalition of social forces, but the production of knowledge that supports it. Thus, the way in which WPs and recyclers' associations will be inserted in IWMS is a central issue, under which a number of specific demands and problems arise. ORIS role is collectively to propose systematization of practical knowledge and organize action-researches to solve WPs demands of technical knowledge and innovation through direct specific actions and directions. ORIS, a locus with characteristics of social and research observatory, constitutes by representatives of WP and solidarity networks formed by WP institutions, supports technicians and NGOs, universities and political forces sympathetic to the inclusive waste recycling cause and their consequent environmental issues. As one of ORIS way of action, there have been organized four open national seminars and three international ones, where important issues regard recycling management, such as alternatives to incineration, circular economy and zerowaste were discussed:

INTRODUCTION

By the end of 1990s, an incident involving human meat intake brought to the Brazilian media headlines the waste pickers (WPs). Since then, with the support of several governmental and non-governmental institutions, this professional segment has been mobilizing and organized as the MNCR¹. In the period some public policies were

¹ abbreviation in Portuguese for National Brazilian Movement of Waste Pickers

conquered, like the inscription of the profession in the national register of occupations. In 2007, the National Sanitation Policy recognizes waste pickers as agents of the sanitation system and the 2010 National Solid Waste Policy details the role of these agents.

In this process a diverse set of researchers — academics, technicians, public managers, WPs — felt the need for a space for reflection and discussion on actions to promote an inclusive and solidary recycling. The Observatory for Inclusive and Solidarity Recycling (ORIS) was constituted in 2012.

This paper focuses on ORIS contribution for Brazilian inclusive and solidary recycling scenario.

SOCIAL OBSERVATORY

Observatory was recognized as an astronomical and meteorological laboratory for describing space phenomena, until prof Harold Laswell (University of Yale) observed, in 1967, that *“the advancement of research projects on health and behavior sciences were no longer subject to limitations on the processing of information but to limitations on the collection of the information needed”* (CATON *et al*, 2015). So he call for the establishment of a system of social observatories, that as the astronomical ones examine various theories that would not *“proven beyond doubt to be correct, their formulation and the discussion they spark help to solve many others unknowns and to define areas of future observation”* (Barabba, 1975, p.12). Social Observatory was then defined as:

“an instrument which provides the means for developing measures of the seeming elusive quality of life [through] social indicators.” (Barabba, 1975, p. 12).

As a computer-mediated research method, McKelvey & Menczer (2013) pointed that social observatory should be concern with reliability, reproducibility, topics filtering, visualization, open access and legal compliance in order to *“facilitate and support the use of mixed methods approaches”*. The modern social observatory is a mixed method analysis; therefore it is inherently iterative and interdisciplinary with the ability to observe a community at a variety of scales — from individual to the whole community (Brückner *et al*, 2015).

The process of democratization in Brazil required a new practice related to social involvement with national governance. The instruments chosen were observatories organized from different perspectives. The Social Observatory of Brazil (SOB) was created to promote social engagement in the control of public management (SHOMMER *et al*, 2015); whilst the Metropolis Observatory is a national network of comparative research on the problematic of the Brazilian metropolis, contributing for the debate amongst government institutions, NGOs, social movements and academia (PASTERNAK, 2012). The ORIS represents another moment that requires a collective and productive reflection to respond the challenges arising from the National Policy on Solid Waste (PNRS²), approved by the National Congress in 2010 after 20 years of discussion.

CHALLENGE

The Brazilian Policy on Solid Waste (BRASIL, 2010) recognizes among its principles that reusable and recyclable solid waste is an economic good with social value, generator of work and income, besides a citizenship promoter³. One of its objectives is to integrate the WPs to the actions involving shared responsibility for the product life cycle and in the integrated solid waste management⁴. For an agreement on these subjects to be possible, Brasil has to recognize not only the existence and the work of the WPs but the important role they and their organizations play. Nevertheless, there is a hard way from the recognition to the practical management routines.

² abbreviation in Portuguese for Política Nacional de Resíduos Sólidos

³ Article 6º, VIII.

⁴ Article 7º, XII

The success achieved by the WPs is adequate to prove what they are capable of; regaining a decent life for millions working with waste from the garbage of society. The difficulties faced by WPs from the PNRS are not due to lack of entrepreneurship or because they are not professionalized, but because they need to change organizational models. There is an increase in the scale of operations, as well as more systematized operations - selective collection, reverse logistics, network marketing - that require new knowledge and new capabilities. By mastering the Social Technology Solidary Selective Collection (Rutkowski and Rutkowski, 2015), they can incorporate new operations, such as estimating investment returns, managing working capital and continuously promoting innovation to increase productivity.

Compared to other technologies such as incineration, the Social Technology Solidary Selective Collection is by far the best to respond the PNRS directives (ORIS, 2013). This assertion is not only proven by comparative cost-benefit assessments or by rates of return, indicators widely used by economists. Technical options are, first and foremost, the result of social options, which in turn results from more or less open conflicts of interests of different social groups having technical alternatives to solve the same problem. The technological options available at a given moment are not only represented by the machines that incorporate them, but they result from trajectories or routes drawn over time that can be more or less strengthened depending on the social resources and energies that each one can attract (ZAOUAL, 2003). Technology efficiency is socially built, so less media visibility and fewer resources for development can stifle an alternative technology (DAGNINO, 2004).

The Social Technology Solidary Selective Collection can trace its origins previously to Eugène Poubelle. When he was the regional administrator of the Seine Department (1883-1896) he ordered the owners of the buildings to provide the residents with three covered containers (*poubelles*) for compostable items, paper and cloth, and crockery and shells. The generalized dissatisfaction turned it into a single container and its contents thrown or in a landfill or incinerated, building up an economic, social and environmental problem (BONJEAN, 2011).

Nowadays, the solution to this problem requires innovations that are in fact appropriate/appropriable by both citizens and WPs. The social intelligence accumulated by the crafts' tradition must now be replaced by the intelligence of social networks articulated around the WPs and their cooperatives / associations, developing innovation to eliminate various bottlenecks and deficiencies in order to institute a new metabolism between society and nature that eliminate waste by reintroducing materials in balanced cycles with (re) use of energy and human labour.

The everyday experience of the WPs on the streets and in the warehouses can challenge theoretical discourses and models, not by the academic demands of scientific production, which work well producing texts, abstracted from their context. Practical experience is measured by confrontation with singular and situated realities and is expressed only partially by speech. Internationalized research deals with decontextualized problems that, in general, are designed to meet the needs of global companies. The crisis of academic knowledge hegemony opens space for necessary transformations in the production of knowledge, a transition that Santos announces between conventional university knowledge for *pluriversity* knowledge, characterized by being transdisciplinary, contextualized and interactive. In the struggle for a counter hegemony, several fronts of action are opening up around another articulation, science of local demands:

"The ecology of knowledges is a deepening of research-action. It is something that implies an epistemological revolution within the university (...). The ecology of knowledges is, so to speak, a form of extension to the contrary, from outside the university into the university. It consists in the promotion of dialogues between the scientific or humanistic knowledge that the university produces, and secular knowledges — popular, traditional, and urban, peasants,

coming from non-Western cultures (indigenous, African, oriental, etc.)" (Santos, 2004, p. 76)⁵.

According to Boaventura Santos, the university, in its *pluriversity* version, needs more *in-tension* than *ex-tension*, to become more pregnant by social demands than to bring its knowledge to the layperson. Struggling in their disciplines, popular and secular knowledges create tensions that lead to new combinations, which will hardly be produced by internal changes (SANTOS, 2004).

Like other technical options at birth, the sustainability of the WPs recycling system depends on the summoning forces of the work experience that, even after the undeniable political achievements, still have to re-appropriate the instruments of its implementation. In this case, the knowledge produced about their work and way of life and the social technology developed. To have control over the researches which are or will be carried out, is nothing more than to appropriate the conditions of reproduction of their own life.

The contemporary criticism of the science hegemonic pretension in the knowledge and technology production led to the recognition of other forms of knowledge that must be rescued and integrated into the devices of creation and use of science. It is not just a critique seeking to legitimize other knowledges side by side with science, but rather to change science and the methods for producing knowledge and developing technology. These relationships can be represented by a tripolar system, common to several knowledge production strategies that associate experts and social subjects, described by different authors, such as the expanded scientific communities (ODDONE *et al.*, 1981; SCHWARTZ, 2000), the dynamic devices at three poles (SCHWARTZ, 2004; TRINQUET, 2010), the participatory research and action research (DIONNE, 2007), the "knowledge production mode 2" (HUBERT, 2005), the ecology of knowledges (SANTOS, 2004).

To choose to represent the systems of knowledge and technology production in tripolar schemes means that the summoning forces of the work experience are assigned a primordial place in order to guarantee the adherence to the real of concepts and theories (SCHWARTZ & DURRIVE, 2007). In the case of public policies, these are mere possibilities:

"This permanent vigilance exercised by work is a *sine qua non* condition to the any policy effectiveness, which is impotent to transform virtualities into reality. The recycling and the selective solidary collection are virtual policies in need to rediscover the vital energy of the WPs to materialize. Their instruments need to be constructed and reconstructed from the needs of the processes of collection, sorting and commercialization in order to overcome impediments to the development of the socio-environmental alternative of waste" (LIMA *et al.*, 2011).

The separation between academia, with its disciplinary interests, and social demands, which require the production of knowledge oriented to solve concrete and complex problems, cannot be solved by experts. The intent watch of the social stakeholders can ensure the convergence of different disciplines around complex practical problems, in order to produce effective and relevant knowledge. Therefore, what was once the "object" of the research — the Waste Pickers — must become the subject of the knowledge production. WPs and researchers should not be level, as if each pole was equivalent or even homogeneous. The specificity of each one is precisely what makes interesting the collaboration in hybrid forums (CALLON *et al.*, 2001). The strong presence of the directly involved social agents is the guarantee to move towards a synthesis of apparently disconnected knowledge. Neither the State, with its funding and research funding agencies, nor researchers and research institutions, and NGOs, possess the control means, the will, and the objective interests to gather the necessary knowledge to solve this kind of real complex problems. So it is up to the proper WPs to conduct the social cooperation process in order to define

⁵ translated by author

technological routes concerning their way of living and working. For Thiollent (2008), the richness of the technological development process depends on the plurality and diversity of the experiences of the workers and the technical staff who support them.

THE OBSERVATORY FOR INCLUSIVE AND SOLIDARITY RECYCLING (ORIS)

ORIS brings together several social agents who advocate recycling as an important inclusive and solidary technology for the treatment of Brazilian urban solid waste. Therefore, it allows the productive reintegration of thousands of waste pickers, based on social relations of boon instead of mediated by mercantile exchanges (SINGER, 2003, POLANYI, 1988). For the development of this economic activity, it is necessary that data and information to be transformed into knowledge and instruments of management for more efficient and effective actions. As a place for reflection, knowledge production and systematization, as well as strategic planning, ORIS aims to define priorities and necessary actions to strengthen the networks and WPs cooperatives / associations into the implementation of Solidary Recycling as THE appropriate technology to deal with urban waste. In this way, the observatory works as an action-research experience, where a collective solution to WPs works and their strategic necessities are built on the basis of the systematic knowledge of their original state and appreciated on the basis of a shared formulation of changes (Dionne, 2007:68; Desroche, 2006:46).

The ORIS organization happened at a turning point in the Brazilian WPs history. There are largescale challenges, given the complexity of the urban waste problematic and the surrounding economic interests. As a monitoring mechanism and a follow-up to the development of solidary recycling, ORIS debates the main issues regarding the WPs' daily life and the social spaces in which they work — from the territories where they collect recyclable materials to the definition of public policies related to the social technology Solidary Recycling. Being a network built around the selective collection and solidary recycling, as a socio-technical alternative to the treatment of municipal solid waste, ORIS has no deliberative function. It proposes to be a device for producing ideas that guide specific actions and projects related to waste pickers, recycling and the environmental issues in general. This space for exchanging ideas and experiences creates a global vision and optimizes specific solutions and actions. It is an environment conducive for elaborating a global strategic planning, which defines priorities and actions necessary to strengthen recycling with the WP institutions inclusion as a technological priority alternative in urban solid waste treatment.

In ORIS arena, WPs, the action actors, evaluate their knowledge and are recognized as social technology developers, woven in popular resistance to guarantee their livelihood. The knowledge of WPs is added to both the technicians and the academics, resulting in a way of dealing with reality towards the economy of functionality. ORIS contribution processes social innovation such as communication mediated both with society through the component of social solidarity in the waste segregation and with the packaging and the recycling industries.

ORIS network was able also to develop equipment and processes to benefit specific WPs necessities. Bag carts to be used inside warehouse and compact conveyor belt with a ditch to feed an auxiliary conveyor belt and benches for allowing a sitting or standing sorting position are two equipment examples. There are processes examples such as selective collection contracts with inclusion of logistics, teams and processes of sorting previous to the warehouse — inside the truck cage and during the truck unloading.

New projects are in course, such as, mini glass crusher plant and warehouse projects appropriate for recyclable sorting and inserted in the territory as urban equipment. Nowadays ORIS major projects are to design a Zero Waste proposal for Brazil prioritizing inclusive and solidary recycling and to publish all its research results in a language easily assimilated to all ORIS members, in order to disseminate this specially to the WPs of all Brazilian regions.

ORIS MEETINGS

The meetings are dedicated to the presentation of the actions developed and in progress, projects and results of research, evaluation of the conjuncture and definition of an agenda of priorities. These meetings are associated with the WPs cooperatives' networks meetings, in order to increase the participation and to associate the debates with actions of technical and political formation. Cycles of studies discuss success cases in depth and seek to define research referrals for systematization and / or dissemination of knowledge. The dynamics adopted are always to start with practical experience, allowing the WPs to place their needs, problems and suggestions, before the experts provide their knowledge to respond to the demands.

As the activities started in order to respond MNCR needs, the ORIS organization was designed based on demands placed directly by the WP or evidenced either in academic projects or in actions of the NGOs that advise the Movement. There are specific committees that maintain a permanent political agenda for debate and social mobilization for recycling. Although the activities of the Observatory do not compete with the specific activities of each institutional agent, they serve as a guide, giving more coherence to the relations between the production of WPs cooperatives associations, the political actions and the production of knowledge and appropriate technology for recycling, without ignoring the social determinations.

After the first year of internal meetings, ORIS decided to organized public seminars and workshops, one per semester. Their target audiences are the public managers and technicians as well as researchers, WPs leaderships, consultants and the academia. These meetings brought international experts in several themes of interest, such as professor Paul Connect, professor Costa Vellis, dr Anne Scheinberg and dr Christiane Bouchart beyond others important Brazilian researchers and technicians on waste management. Each of the seminars was attended for more than 200 professionals of different sector and professions. The seminar themes are collectively decided and bring to debate technological and policies innovation, aiming to improve the Brazilian perspective of an inclusive and solidary recycling. The themes treated so far are:

- Access to market;
- Clean energy generation;
- Dissemination of social technologies;
- Dissemination of Solidary Economy;
- Diverse strategies of developing inclusive recycling in the world;
- Formation and Professionalization of WPs;
- Gender and informal working market;
- Inclusion of autonomous WPs from the streets and dumpsites;
- Market of Recyclables;
- Models of Shared Responsibility on Waste Management;
- New models of integrated management of SWU;
- Organic Recycling;
- Organization and Management of Networks;
- PNRS and the participation of WPs cooperatives / associations;
- Recycling or Incineration?
- Service Pricing Instruments;
- Solidary Selective Collection: benefices and costs;
- Solidary Selective Collection: multimodal logistics;
- Warehouses internal production organization;
- Work processes;
- WPs cooperatives services contracts by Municipalities;
- WPs Organization: cooperatives, networks, projects and support actions;
- ZeroWaste and Incineration impacts.

The most recent events have been devoted to the discussion of the Circular Economy and Economy of Functionality and the various practical approaches to constitute them.

The first documents produced collectively designed the alternatives of technological routes that favored the inclusive and solidary recycling. These documents have been used by the main development agencies such as the IDB, World Bank, MIF, and the Latin American Articulation of Collectors, Forum of Waste&Citizenship, Government of the state of Minas Gerais. They also carry out the actions of the MNCR, as well as subsidize the private initiative and the various spaces for public policy formulation of solid waste. Spaces where the government plans for the correct disposal of waste and the closure of dumps with eradication of human labor are discussed.

Finally, a challenge to be faced is how to make all the discussion produced reach the baseline, since the fundamental role of all ORIS actions is to respond the daily needs of the WPs in their cooperatives. ORIS aims to the person sorting and collecting recyclables, which requires searching for more appropriate languages, as images and/or audiovisual products. Thus, the experience that is developed in the practice of meetings, activities and debates makes the Observatory operation more coherent with the principles that gave rise to it.

ORIS ORGANIZATION

ORIS is coordinated by INSEA (Nenuca Institute of Sustainable Development), a nationwide NGO developing environmental management models based on social inclusion; SUSTENTAR Institute Interdisciplinary for Studies and Research on Sustainability, a non-profit NGO which develops social technologies to support sustainability; ALTER-NATIVAS, Engineering Production Nucleus of the UFMG (Federal University of Minas Gerais) Engineering School and MNCR (WP National Movement). There are among their members international organizations: WIEGO, Women in Informal Employment: Globalizing and Organizing and Fundación AVINA; WP cooperatives networks: RedeSol, CataUnidos, Catavales, Rede Sul Minas; a National Bank: Banco do Brasil (Regional Sustainable Development, Minas Gerais); National NGO: CNDDH, National Center for the Defense of Human Rights and Movimento Nossa BH; professional organizations: Parangolé Art Mobilization (theatre, social mobilization and consulting) and ANCAT (Cart Drivers and WP National Movement); university research group: FLUXUS/UNICAMP.

BIBLIOGRAPHY

Bonjean, O. (2011). *De l'or dans nos poubelles*. Dax: Éditions Carbonnier-Quilateau.

Barabba, V P. (1975) Social ObservatoriesThrough a Glass, Less Darkly **In** US Bureau of the Census, The Census Bureau, A Numerator and Denominator for Measuring Change, Technical Paper 37, US Gov Printing Office, Washington, DC

BRASIL. (2010). Lei 12.305 de 02 de agosto de 2010. Institui a Política Nacional de Resíduos Sólidos; altera a Lei nº 9.605, de 12 de fevereiro de 1998; e dá outras providências. **Diário Oficial da União**, Atos do Poder Legislativo, Brasília, DF, 03 ago 2010. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/l12305.htm

Brückner, L; Caton, S; and Hall, M A., "FBWatch: Extracting, Analyzing and Visualizing Public Facebook Profiles" (2015). Interdisciplinary Informatics Faculty Proceedings & Presentations. Paper 8. <http://digitalcommons.unomaha.edu/interdiscipinformaticsfacproc/8>

CALLON, M.; LASCOUMES, P.; BARTHE,Y. *Agir dans un Monde Incertain. Essai sur la démocratie technique*. Paris: Le Suil, 2001.

Caton S, Hall M, Weinhardt C. (2015) How do politicians use Facebook? An applied Social Observatory. *Big Data & Society*, 2(2): 1-18.

DAGNINO, R. (2004) A tecnologia social e seus desafios. In: Fundação Banco do Brasil (org.) *Tecnologia Social – uma estratégia para o desenvolvimento*. RJ: DP&A Editora.

DESROCHE, H. (2006) Pesquisa-ação: dos projetos de autores aos projetos de atores e viceversa. In: Thiollent, M. (org.) *Pesquisa-ação e projeto cooperativo na perspectiva de Henri Desroche* São Carlos, SP: EdUFSCar, p.33-68

DIONNE, H. (2007) *A Pesquisa-ação para o desenvolvimento local*. Brasília, Líber Livro Editora, 132p. (translation Michel Thiollent)

HUBERT, B. (2005). In: Teulier, R.; Lorino, P. (ed) *Entre connaissance et organisation*. La Découverte. 2005

Lasswell, H. D. (1967). Do we need social observatories?. *The Saturday Review*, 49-52 apud Caton S, Hall M, Weinhardt C. (2015) How do politicians use Facebook? An applied Social Observatory. *Big Data & Society*, 2(2): 1-18.

LIMA, F. P. A., VARELLA, C. V. S., OLIVEIRA, F. G., PARREIRA, G. F., RUTKOWSKI, J. (2011). Tecnologias sociais da reciclagem: efetivando políticas de coleta seletiva com catadores. *Geraiis: Revista Interinstitucional de Psicologia*, v.4, p.131-146

LIMA, F.P.A. Das condições de produção de um saber interdisciplinar: a função da experiência do trabalho. In: CUNHA, D M (org.). (2007). *Trabalho: minas de saberes e valores*. Belo Horizonte: NETE/FAE/UFMG, p. 252-259.

McKelvey, K. and Menczer, F. (2013), "Design and prototyping of a social media observatory", Proceedings of the 22nd international conference on World Wide Web companion, Rio de Janeiro, International World Wide Web Conferences Steering Committee, Geneva. pp. 1351-1358

ODDONE, I.; RE, A. & BRIANTE, G. (1981). *Redécouvrir l'expérience ouvrière*. Paris, Editions Sociales.

ORIS (2013) Constructing a Technological Route for Solid Waste that Promotes Recycling , Final Document, I Seminário Rotas Tecnológicas para a Reciclagem, UFMG/BH/MG, available at www.sustentar.org.br

Pasternak, S (2012) Changes in the socio-occupational structure of the Brazilian metropolises, 1991-2000. *Cadernos Metrôpole*. São Paulo, v. 14, n. 27, pp. 233-278. DOI: <https://revistas.pucsp.br/index.php/metropole/article/view/14789>

POLANYI, Karl *A grande transformação*. RJ: Ed. Campus. 1988.

Rutkowski, J.E. & Rutkowski, E.W. (2015) 'Expanding worldwide urban solid waste recycling : The Brazilian social technology in waste pickers inclusion', *Waste Management & Research*, 33(12).

SANTOS, B de S. (2004). *A universidade no século XXI*. São Paulo: Cortez Editores

Schommer, P C, Rocha, A C, Spaniol, E L, Dahmer, J, & Sousa, A D de. (2015). Accountability and co-production of information and control: social observatories and their relationship with government agencies. *Revista de Administração Pública*, 49(6), 1375-1400. <https://dx.doi.org/10.1590/0034-7612115166>

SCHWARTZ, Y. (2000). "A comunidade científica ampliada e o regime de produção de saberes", in *Revista Trabalho e Educação*, revista do Nete, FAE-

UFMG, jul/dez 2000, pp 38-46.

SCHWARTZ, Y. (2004). "Ergonomia, filosofia e exterritorialidade". Trad. in: Daniellou, François. *A ergonomia em busca de seus princípios*. São Paulo: Ed. Blucher, 2004.

SCHWARTZ, Y. e DURRIVE, L. (org.). (2007). *Trabalho & Ergologia: Conversas sobre a atividade humana*. Niterói: EdUFF, 2007.

SINGER, P; SOUZA, A R. (orgs.) *A economia solidária no Brasil: a autogestão como resposta ao desemprego*. São Paulo, Contexto, 2003, 2ed., 360p.

THIOLLENT, M. *Metodologia da pesquisa-ação*. 16. ed. São Paulo/ SP: Cortez, 2008.

THIOLLENT, M. Problemas de Metodologia. In: FLEURY, A.; VARGAS, N. (Org.) *Organização do Trabalho: uma abordagem interdisciplinar*. São Paulo/ SP: Atlas, 1983.p.54-83.

TRINQUET, P. (2010). Trabalho e educação: o método ergológico. *Revista HISTEDBR On-line*, Campinas, número especial, p. 93-113, ago.2010

ZAOUAL, H. (2003) *Globalização e Diversidade Cultural. Textos selecionados e traduzidos por Michel Thiollent*. São Paulo/SP: Cortez Editora.