

Analysis of the Brazilian production of theses and dissertations about recyclable material pickers according to the conception of science in the XXI century

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ABSTRACT

Starting from the idea that the logic of the Science, Technology and Innovation Policy follows the development of the concept of what science is, and using as parameter for analysis the phases in which this development was divided from the Post-War period, in the mid-twentieth century, to the present time, this work aims to take outcomes from a quantitative research of theses and dissertation productions on the theme of the recyclable material pickers, considering the terms "picker" and "recyclable" related to other specific ones (co-operative, solidary economy, family and mental health). For its development it has been used the Bank of Theses and Dissertations of the Coordination of Higher Education Personnel Improvement, via the search option "subject" and the definition "all terms". From the searching result, data have been analyzed and then it could be demonstrated the evolution of the productions per year as well as the multidisciplinarity related to the theme due to different types of Graduate Programs involved. It has been observed that works on the general theme (represented by the terms "picker" and "recyclable" both combined), detected since 1996 and combined with the specific themes, began to be registered in combination with the specific since 1999, coinciding with the transition to the current XXI century context, called "Science For Society's Welfare", a concept still under construction. It has also been possible to associate the period of onset of the theses and dissertations with these terms to important moments on the development of the history of the pickers, the solidary economy movement and the Brazilian Science and Technology Policy. It is hoped that the results of this study may serve as a guide and database for future researches, as well as enhance reflections on this scientific moment which coincides with a growing pursuit of social welfare.

Key words: Science and Technology Policy. Recyclable material pickers. Academic-scientific publications. Brazilian Graduate Programs. Conception of science.

Introduction

After the Second World War, several agents of the scientific field clashed with the possibilities of using the technologies developed as a way of destruction of human life and our planet. Velho (2011) tells us of this context, referring to Dickson (1988), explaining the rise of a new conception of science that concerns the establishment of a balance. The science then joins the policy and governments with a mission to achieve defined objectives, as well as the science policy, by the globalization process, follows rules similar to international policies on Science, Technology and Innovation (STI), disregarding the specificities of each country. Therefore, it can be said that the

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management of Science, Technology and Innovation Policies (STIP) is shaped by the concept of science understood in every age (VELHO, 2011). According to this author, it is possible to categorize science in a time line that includes the Post-War, in the last century, until nowadays in four periods.

The period corresponding to the Post-War until the early 60s the author names as "Science as Engine of Progress" because science is considered autonomous in relation to social processes and not considered responsible for the consequences and results of its using. The so called "basic science" is the focus in this period, and behavioral norms such as universalism, communism, disinterestedness and organized skepticism are introduced by Merton (1970) to the scientists, excluding this way any value or influence on the social sciences produced.

Among the decades of 60 and 70, in the period named by the author as "Science as Solution and Cause of Problems" arises the thought about the values within the science and its negative impacts on society, the relations of science and technology to society become objects of study, taking place the debate over the possibility and need of their aims and usage to be controlled. It is considered that scientists have to work on themes relevant to society and companies have knowledge about which sciences and technologies are needed before the demands, and the focus of this period is the market.

In the period called "Science as Source of Strategic Opportunity", corresponding to the decades of 80 and 90, Velho (2011) argues that science is designed by critics as a social construction (design not accepted by researchers of natural sciences), considering knowledge as something constructed by the relationship between multiple agents (multidisciplinarity). It gives rise to several theories, among them the actor-network, which different authors deal such as Latour and Woolgar (1997), who consider the production of knowledge and social structure inextricably linked. It is noted the grip of politicians to systemic models, the search for fostering agencies to fund interdisciplinary projects and the joint efforts of public and private sectors. New methods of assessing the economic and social impacts of sciences and technologies are sought, besides the peer assessing of scientific productions, occurring the incorporation of external actors to the scientific community.

In this transitional phase that ends in the 90s, it already begins in the XXI century a paradigm still under construction called "Science for Society's Welfare", which is still struggling with the above Velho (2001). The author takes up here the criticism on the practice of imitative public policy models, upholding national and local focus, as well as the history that surrounds it, allowing considering the particular cultures, needs and resources of each people, including their knowledge, in scientific construction.

Still recent, this debate is labored by several authors of Social Studies of Science, among them Latour (2000, p. 233, our translation), who makes the following statement about the need to "invent" a society: "It creates an artificial division between weaker and stronger associations (...) that's how you end up with the idea that there are three spheres: Science, Technology and Society".

Generation of knowledge then leaves the laboratories and takes place at several sites, such as in the field, interdisciplinarily (with the correlation between knowledge of various areas), blurring the company as a determinant in the technological choosing, which can then be controlled by the society (VELHO, 2001).

The beginning of the XXI century in Brazil is a period in which it begins to prioritize the theme of social inclusion, occurring in the Lula government, when it is created the Department of Science and Technology for Social Inclusion in the Ministry of Science and Technology. Even with limited resources of enforcement agencies, *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq - National Counsel of Technological and Scientific Development) and *Financiadora de Estudos e Projetos* (FINEP - Studies and Projects Finance Organization), the efforts involved in this change of focus is a major highlight of this period (MACIEL; FERNANDES, 2011). The "popularization of science" also begins to be encouraged, even with diffuse and under construction policies (Alcântara, 2011). This very government still creates in 2003 the *Secretaria Nacional de Economia Solidária* (SENAES - National Solidary Economy Secretariat), aiming at the generation of employment and income along with social inclusion (MTE, 2012; FBES).

Thereby, it becomes important to analyze the academic and scientific productions, considering the periods of development of scientific concepts and policies related to science and technology, as well as the context on the research themes, to reflect on the performance of universities.

In this article, a quantitative analysis is made on the evolution of the production of theses and dissertations of Brazilian graduate institutions about recyclable material pickers and some topics related by years, as well as its occurrence per course.

The terms chosen have their relation to recyclable material pickers presented throughout the text and are related to keyword research carried out by the authors.

Purpose

This work aims at the presenting of the results of a quantitative research on the Brazilian academic-scientific production (theses and dissertations) on the theme of the recyclable material pickers, with its terms (picker and recyclable) related to other specific ones (co-operative, family, mental health and solidary economy).

Search strategies and data systematization

The research of production was carried out using the Bank of Theses and Dissertations of the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES - Coordination of Higher Education Personnel Improvement) to identify the theses and dissertations published in Brazil on recyclable material pickers, associated with the terms: co-operative, family, mental health and solidary economy. The searching for the information and systematization took place in June 2012 and in the first half of 2013 it was reviewed, in which no changes were observed in the acquis searched.

The Bank of CAPES, featuring Brazilian data from 1987 onwards, allows to search in different ways, and the research of productions was performed by subject, using the option "all words" in order to find works to contemplate all possible combinations of terms. The results for the searched terms picker, recyclable, co-operative and family in both the singular and plural were the same.

The combination of only the terms picker and recyclable were not represented on the chart, but only considered and denoted as the large set containing all the other results of combinations of the searched terms.

These combinations were systematized in two charts: Chart 1, they were organized by year, and Chart 2, they were organized by graduate course. To get to these two charts, it was performed a extensive organization of data, looking for convergences between jobs that were included in more than one combination of terms. These convergences were indicated in a footnote, and the numbers and sum of terms presented in both charts by column, but the lines by year and course, these repetitions were not considered to represent the overall result of works cataloged.

Pickers, Co-operative, Solidary Economy, Family and Mental Health

The general theme of this research - recyclable material pickers - is a job category recognized as an occupation by *Classificação Brasileira de Ocupações* (CBO - Brazilian Classification of Occupations) since 2002. But it is important to mention that picking is part of the occupations' world for at least fifty years (MOVIMENTO, 2005) and is often linked to the Technological Incubator of Popular Co-operatives (TIPCs), which since 1995 has emerged in universities (SINGER, 2002), allowing the development of knowledge and the intervention with economic-solidarity projects (CRUZ-SOUZA et al., 2010). In recent years, the number of pickers arranged in these projects increased, which stand as an alternative to workers seeking ways to get work and income (MOVIMENTO, 2005). In this sense, the actions taken by the TIPCs lead the University to fulfill its social role as a producer of knowledge.

In portuguese, the CBO names the job category with the term "*catador de materiais recicláveis*" (in a literal translation: collector of recyclable materials), however it is considered that the picker picks recyclable "waste", as well as he is a picker, differently from a collection maker. Therefore, some texts in Portuguese choose to the name given by the CBO, which refers to the very

name given by the pickers themselves, and others choose to use the term "waste" instead of "material". As Logarezzi (2006, p. 105, our translation) says, the material is:

Solid phase that makes up part of any object which features specific properties, consistent with the structural, functional and esthetic performance of the application that the part of the object composed of the material is designed to (this part may possibly be the actual waste as a whole: plastic cup, for example). This phase (...) is different from the waste once a waste generally consists of different materials (...). Thus, there's no picking of (recyclable) materials, but picking of (recyclable) waste. Similarly, there's no sorting of (recyclable) material but sorting of (recyclable) waste, in which it is adopted the criterion of the predominant material in the waste aiming at commercializing it to the recycling industry where the recyclable waste is converted in recycled material.

In this work, it was chosen the usage of the term "recyclable material pickers" because it's the usual term in the CBO to refer to this specific kind of worker.

The realization of picking as an income generating activity in Brazil came about by the constant growth of unemployment (MOVIMENTO, 2005) that occurred in the setting of development of the capitalism in the XX century, when there was a major technological breakthrough and a resulting replacement of the hand-human labor by machine labor. Considering the appearance of pickers around the 50s, it's possible to relate this to the Post-War period described by Velho (2011) as a period in which the science and technology produced were devoid of value and social control. Then there was a clustering of unemployed individuals in the informal work sector (ANTUNES, 2007; CASTELS, 2009), which promoted the increase of the competition for jobs and income and decreased the power of the workers about their rights, (POCHMANN, 2001). This scenario consequently led to exploitation of the workforce and to precariousness of labor relationships (SINGER, 1998).

Work allows the individual to form a sense of life to contribute to the development of personality and identity (FILIZOLA *et al.*, 2010). The inclusion of workers in economic-solidarity projects and economic solidarity enables thereby promoting meaning to work, favoring the implication of value to the employee (GAIGER, 2004). Whereas exclusion attacks identity and may even lead to mental or physical illness (DEJOURS, 1999) and it is related to the fragility of social supports (BORGES; KEMP, 2008), economic-solidarity projects also become potential to the promotion of worker health.

According to Zimerman (2000), the human remains or exists only as a function of its inter-group relationships in a dialectic between the pursuit of its individual identity and the need for group identity, making it important in studies about pickers, co-operatives and solidary economy, to analyze the household, since among other social groups, the first social network available is the family (FILIZOLA *et al.*, 2010).

It is considered that co-operative is "a partnership with own shape and legal nature, civil, not subject to bankruptcy, established to provide services to its members" (HIRIART, 1990 *apud* PINHEL; ZANIN; MONACO, 2011, p. 64, our translation). It covers both the economics and the social, and the cooperated individual is both user and owner, providing a self-management model. These projects have important potential in combating unemployment by improving the socioeconomic condition of workers (SINGER, 2002a). Whereas the worker spends most of the day in the workplace, and this situation is directly linked to an individual's ability to produce its sense of existence and set up new relationships (FILIZOLA *et al.*, 2010), it can be said that besides being an economic possibility, co-operative work based on solidary economy also interferes with the subjectivity of the cooperated workers (PEREIRA; CARVALHO; LADEIA, 2008).

Co-operatives of pickers are, according to Magera (2005, *apud* PINHEL; ZANIN; MONACO, 2011), a democratic and collective form of organization that begins informally and can potentially evolves with the support of partner institutions (non-governmental organizations, TIPCs, government etc.). The struggle of pickers in searching for better working conditions and social inclusion is recognized in Brazil since 2002 to the *Movimento Nacional de Catadores de Materiais Recicláveis* (MNCR - National Movement of Recyclable Material Pickers) (MOVIMENTO, 2005).

In the Brazilian context, the solidary economy appeared in the decade of 80s, during the XX century, in times of great economic crisis and inflation in Brazil. The solidary economy was constituted as an alternative to the unemployed, enabling their organization into co-operatives and the recovering, by workers, of bankrupt companies, (SINGER, 2002a), leading to the maintenance of jobs, what results in several other personal and social gains.

In Paul Singer's words:

The solidary economy was created by workers in the early days of industrial capitalism as a response to poverty and unemployment resulted from 'deregulated' diffusion of machine-tools and steam engine in the early XIX century. Co-operatives were workers' attempts to recover employment and economic autonomy, taking advantage of new productive forces. Its structuring obeyed the basic values of the working class movement for equality and democracy, synthesized in the ideology of socialism (SINGER, 2002a, p. 1, our translation).

Historically, the solidary economy, which principles defend collective or associate property, individual freedom, equalitarian income distribution and solidarity, enables the promotion of meaning to the work, favoring the implication of value to the employee (GAIGER, 2004), what would be impossible in a situation of unemployment or informal employment (DAL MAGRO; COUTINHO, 2008). It can be defined as "the set of economic activities – of production, distribution, consumption, saving and credit - organized and conducted in solidarity by workers, men or women, under a collective and self-management form" (BRAZIL, 2006, our translation), and according to the *Fórum Brasileiro de Economia Solidária* (FBES - Brazilian Forum of Solidary Economy) it constituted itself from the foundation of a humanizing globalization, with a sustainable development (economic, environmental and social along), considering the intergenerational aspect of this in the quality of life. So, through co-operatives, workers aimed at generating work and income due to ideals of equality and democracy (SINGER, 2002a).

The economic-solidarity projects supported in Social Technology (ST) may potentiate their forms of organization, in support of the resistance and questioning of the structural organization and capitalist advance (DAGNINO, 2009), and the ST is built collectively, considering the knowledge of all the stakeholders (DAGNINO, 2004). The ST is defined by the *Rede de Tecnologia Social* (RTS – Social Technology Network) as "products, techniques and / or replicable methodologies, developed in the interaction with the community that represent effective solutions for social transformation" (RTS, 2005, our translation) and by the *Instituto de Tecnologia Social* (ITS - Institute of Social Technology) as "a set of transforming techniques and methodologies, developed and / or implemented in the interaction with the public and appropriated by it, that represent solutions to social inclusion and improvement of living conditions "(ITS, 2009, p. 13, our translation).

The current development of solidary economy, which historically has already proven its ability to overcome social and economic exclusion, is then based on the dissemination of ST as a way to implement the solidary economy as well as the knowledge about it (SINGER, 2002a).

To Singer (2002b, p. 89, our translation), there are countless advantages in organizing the recyclable material pickers into co-operatives:

The co-operative enables purchases in common at lower prices and selling in common at higher prices. As economic and political entity, the co-operative represents the pickers before the government and claims from it the protected space to store and sort the collected material and funding for processing part of the material separated, adding value to it. A co-operative is an opportunity to restore the human dignity of the picker and development of self and mutual help, what allows the constitution of the pickers' community.

Gaiger and Laville (2009) find that the group performance, surrounded by self-management, leads to the formation of new agents that contribute to the quest for welfare.

Science, Technology and Society and the University social role

Lopez Cerezo (2000) points out that due to the need for the existence of a public regulation of the sciences and technologies produced, the field Science, Technology and Society (STS) has come up, which takes into concern the relationships between the subjects involved (researchers, population, fostering institutions, universities, etc.) and not only established. This field has begun about the same time in different locations around the world. According to Jiménez-Ottalengo and Llergo (2003) and Lisingen (2004), the field STS has arisen in developed countries, mainly in response to the impact of technological development on the environment and society in the decades of 60s and 70s, in the context of Post-War. On the other hand, in Latin America it's begun with the need for more scientific and technological independence in relation to developed countries.

In this period, the Brazilian industry (with national capital) was in a technologically weaker position compared to transnational corporations. It also occurred the allying between the Brazilian government and military elites, as well as the research community, looking for more technological autonomy (DAGNINO, 2009). "In Brazil, due to the military's project "Brazil-Great-Power", which required a high degree of technological autonomy to be built in the long term, there was considerable support for research." (DAGNINO, 2009, p. 103, our translation).

It can be argued that the development of scientific-technological, production and ideological processes along with political alliances between the scientific community and the bureaucratic and economic elites, resulted in the formulation of the Science and Technology Policy (STP) in Brazil, as well as the use of the ideas of *Pensamento Latino-Americano em Ciência, Tecnologia e Sociedade* (PLACTS - Latin American Thought on Science, Technology and Society) in the analysis of the STP (DAGNINO, 2009).

Thinking of the social role of the university, it may indicates that – perhaps to find resolutions to the problems of humanity – the principles of scientific research should be applied for the social environment, not realizing only the implementation of technologies (SCHWARTZMAN, 2008).

A challenge for the universities then is to make possible for the population to access scientific and technological knowledge (OLIVEIRA; ZANIN, 2011). Another one would be acting simultaneously with the population, generally with scarce resource, looking for better conditions of life for most of that by the training of people with appropriate behaviors for this (CRUZ-SOUZA, 2010).

In 1995, came up at *Instituto Alberto Luiz Coimbra de Pós-Graduação e Pesquisa de Engenharia da Universidade Federal do Rio de Janeiro* (COPPE/UFRJ - Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering), by partnership with FINEP and *Fundação Banco do Brasil* (Bank of Brazil Foundation), the first TIPC, which now fills an important gap for the consolidation of economic-solidarity projects through the assistance of them. In continuation, the *Programa Nacional de Incubadora de Cooperativas Populares* (PRONINC - National Popular Cooperatives Incubators Program) was created in 1998, and the institutions FINEP and Fundação Banco do Brasil went to finance the forming of new TIPCs (SINGER, 2002a).

Results, data analysis and discussion

The result of searches in the Bank of Theses and Dissertations from CAPES allowed to identify works from 1987. There're found 198 dissertations and 43 theses using the terms "picker" and "recyclable", being the first occurrences of publications respectively in 1996 and 1997, however these data were not systematized serving as reference only, since all other results discussed in this work are inserted into it.

The first publications on the overall theme (recyclable material picker) occur soon after the emergence of the first TIPC, being the dissertation of 1996, and the date of emergence of the first TIPC, 1995.

Seeking the various possible combinations of terms (picker, recyclable, co-operative, family, mental health, solidary economy) it was found 80 dissertations and 22 theses dated from 1999 to 2011. The combinations that do not appear in the charts or in the text were not found.

Some works have appeared in the results of various combinations, but repetitions were not added in total, just placed in the chart for representation, as well as some combinations have not been represented in the tables, but will be discussed.

With the systematization of data, it can be observed that the total of 102 works, systematized in Chart 1 per year according to the combinations of terms, showed that, comparing the years 1999 and 2011 there was an increase in the amount of production (from 01 to 14) on the period. But this increase is not linear, and on the analysis year by year it's observed little ups and downs in the beginning, and from 2010 to 2011 there was a decrease in the production from 22 (largest amount in the period) to the 14 already mentioned.

The first productions available to treat the terms "Co-operative/Picker/Recyclable" are also from 2002, year in which this category of work was recognized. It is also from this period the construction of the paradigm of "Science for Society's Welfare", which has great relevance, since this organization "can help to improve society by new work opportunities, social justice and more balanced income distribution" (PINHEL; ZANIN; MONACO, 2011, p. 65, our translation). Considering that there are approximately 500,000 pickers in Brazil (MEDEIROS; MACEDO, 2006) it can be stated that the sciences and technologies carried out on this theme are relevant and can somehow contribute with social impacts.

In the following years of the creation of SENAES, what occurred in 2003, there was also a growth in the number of works related to the terms "Picker/Recyclable/Solidary Economy" and yet these terms increased by "Co-operative". These works began to come up in 2005.

In Chart 2, the productions are systematized by course/terms, representing the 18 courses with the highest output numbers among the 52 found, accounting for approximately 66.6% of the total output in the period (68 of 102). It is observed that the production occurs multidisciplinarily, with researchers trained in different areas, with different knowledge, not restricting researches just to a dominant area.

The course with the highest number of publications was Production Engineering, with a total of 08 (06 dissertations and 02 theses using the terms "Picker/Recyclable/Co-operative"), and 01 of these theses also appeared in the search results for "Picker/Recyclable/Solidary Economy" and these plus "Co-operative"), followed by Sustainable Development and Economics majors, both with 06 dissertations and no thesis with the combinations "Picker/Recyclable/Co-operative", and 01 coursework of Sustainable Development has also appeared in the results for the terms "Picker/Recyclable/Family".

The combined terms that have returned less in quantity of production on the search were "Picker/Recyclable/Mental Health", which had just a single dissertation linked to the Health Psychology major, and only one more work besides this related to the Biotechnology Applied to Children and Adolescents' Health course (which has also appeared as a single result for the terms "Picker/Recyclable/Co-operative/Mental Health", and has not been shown in the chart). Theses haven't been found on this search.

It has been observed that 9.8% of the 102 works analyzed in this article referred to the term social technology (or to its plural) in the title, the keywords or abstracts. It is important to mention this because social technology is based on self-managing projects and micro and small companies, as well as it is adaptable to local social conditions aiming at more appropriate resolutions to the context in which they grow (DAGNINO, 2004).

According to the author, social technologies also impact on the State and its relation to science and technology, because according to the way of thinking about social technologies, the State should be responsible for funding socio-technical development (DAGNINO, 2004).

Chart 1 – Production of Theses and Dissertations Quantity by Terms/Year²

Terms Year	DISSERTATIONS					THESES				TOTAL All terms
	Picker/ Recyclable/ Co-operative	Picker/ Recyclable/ Family	Picker/ Recyclable/ Mental Health	Picker/ Recyclable/ Solidary Economy	Picker/ Recyclable/ Co-operative/ Solidary Economy	Picker/ Recyclable/ Co-operative	Picker/ Recyclable/ Family	Picker/ Recyclable/ Solidary Economy	Picker/ Recyclable/ Co-operative/ Solidary Economy	
1999	-	01	-	-	-	-	-	-	-	01
2000	-	01	-	-	-	-	-	-	-	01
2001	-	-	-	-	-	-	-	01	-	01
2002	01	01**	-	-	-	01	-	-	-	02
2003	-	-	-	-	-	01	-	-	-	01
2004	02	-	-	-	-	-	-	-	-	02
2005	07	01**	01*	05***	05***	-	-	-	-	07
2006	04	-	-	03***	01***	03	-	01***	01***	09
2007	08	01	-	05***	04***	01	-	-	-	11
2008	09	03**	-	03***	02***	03	-	01***	01***	15
2009	10	01	-	01***	01***	03	01	02***	01***	16
2010	15	04**	01	01***	01***	03	01	02***	02***	22
2011	08	01	-	02	-	03	-	01***	01***	14
TOTAL	64	14	02	20	14	18	02	08	06	102

Source: Bank of Theses and Dissertations CAPES. Chart prepared by the authors.

² *DISSERTATIONS: 2005 (01) with the terms **Picker / Recyclable / Mental Health** is in **Picker / Recyclable / Cooperative / Mental Health** which was not represented in the chart for owning only this work.

DISSERTATION: 2002 (01) 2005 (01) 2008 (01) 2010 and (02) with the terms **Picker / Recyclable / Family are found in **Picker / Recyclable / Co-operative** and are not added in total.

***THESIS and DISSERTATION: 2005-2011 (ALL) with the terms **Picker / Recyclable / Cooperative / Solidary Economy** are found in **Picker / Recyclable / Solidary Economy** and these convergences are in **Picker / Recyclable / Co-operative** and are not added in total; DISSERTATION: 2005 (01) with the terms **Picker / Recyclable / Co-operative / Solidary Economy** is also in **Picker / Recyclable / Family**.

Chart 2 – Production of Theses and Dissertations Quantity by Terms/Course³

Terms Course	DISSERTATIONS					THESES				TOTAL All terms
	Picker/ Recyclable/ Co- operative	Picker/ Recyclable/ Family	Picker/ Recyclable/ Mental Health	Picker/ Recyclable/ Solidary Economy	Picker/ Recyclable/ Co- operative/ Solidary Economy	Picker/ Recyclable/ Co- operative	Picker/ Recyclable/ Family	Picker/ Recyclable/ Solidary Economy	Picker/ Recyclable/ Co- operative/ Solidary Economy	
Production Engineering	06	-	-	01***	01***	02	-	01***	01***	08
Sustainable Development	06	01**	-	-	-	-	-	-	-	06
Economics	06	-	-	-	-	-	-	-	-	06
Social Science	03	02**	-	02***	02***	01	-	-	-	05
Education	01	02	-	-	-	01	-	01	-	05
Social Service	01	01	-	01	-	02	-	01***	01***	05
Sociology	03	-	-	02**	02***	01	-	-	-	04
Management	02	-	-	02***	01***	01	-	-	-	04
Geography	01	-	-	02***	01***	02	-	-	-	04
Environmental Science	02	-	-	01***	01***	01	-	01***	01***	03
Civil Engineering	03	-	-	-	-	-	-	-	-	03
Public Health	01	-	-	01***	01***	02	-	-	-	03
History	01	-	-	01***	01***	01	-	-	-	02
Psychology	02	-	-	-	-	-	-	-	-	02
Health Psychology	02	-	01	01***	01***	-	-	-	-	02
Sanitation, Environment and Water Resources	02	-	-	-	-	-	-	-	-	02
Technology	01	01	-	-	-	-	-	-	-	02
Social Psychology	-	-	-	-	-	01	-	02***	01***	02
Other Courses	21	07	01	06	03***	03	02	02	02***	34
TOTAL:	64	14	02	20	14	18	02	08	06	102

Source: Bank of Theses and Dissertations CAPES. Chart prepared by the authors.

³ **DISSERTATIONS: Social Sciences (01) and Sustainable Development (01), with the terms **Picker / Recyclable / Family** are found in **Picker / Recyclable / Co-operative** and aren't added in total.

*** DISSERTATIONS and THESIS (ALL): with the terms **Picker / Recyclable / Co-operative / Solidary Economy** are found in **Catador / Reciclável / Economia Solidária** and this convergences are in **Picker / Recyclable / Co-operative** and aren't added in total; DISSERTAÇÕES (01): of the course Social Science with terms **Picker / Recyclable / Co-operative / Solidary Economy** are also in **Picker / Recyclable / Family**.

Final Remarks

Due to the historical context of economic and social exclusion occurred in the XX century by the replacement of human labor by machines because of technological advances, which caused unemployment, there was the rise of the occupation of picker in Brazilian cities. This economic activity depends on the regional and political characteristics and the relationships surrounding this issue, it's quite interesting the appearance of productions focused on this issue in this period of construction of the meaning of contemporary science, when it's presented for social welfare.

It is also important to consider the need for construction of indicators on the scientific and technological development that occurs multidisciplinarily, being considered not consistent with this model, to the evaluation of scientific production, the primary indicator of disciplinary models.

Thus, the multidisciplinary identified by the present results makes it important to aggregate knowledge and allow social changes that favor this socially excluded people to enhance and get included economic and socially, with their knowledge taken into account in the scientific literature. From the research conducted at the Bank of Theses and Dissertations of CAPES, it can be observed that university researchers and Brazilian institutions have been concerned with this excluded population (recyclable material pickers), which is represented by the general increase in academic researches on the subject in the period in different areas of knowledge.

Studies associating pickers' mental health to their family bonds and economic-solidary values, among which is the co-operative activity, are still few and may be lacking to direct appropriate public policies into the holistic development of the research subject.

Therefore, it is expected that this work may contribute to the enhancement of this scientific moment of social welfare, as identified in the context of Brazilian Universities, serving as a database for future research.

It's indicated the need for qualitative analysis of scientific production in order to analyze the nature of the works published. This qualitative analysis would be important to indicate the objectives and outcomes of the productions analyzed here in a quantitative way, enabling better analysis both in relation to the periods in which they occurred as in relation to the concepts and policies for science and technology. Another important qualitative analysis of these productions would be in relation to the theory that involves the searched terms, and would be important to identify the level of access of this excluded population to scientific and technological knowledge, assessing whether it occurs or not to the popularization of science, proposed by the Lula government in the XXI century.

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