

CHEMICAL SAFETY OR ISOMORPHIC PROTECTION? AN ANALYSIS OF THE GENESIS OF THE DRAFT LEGISLATION ON ASSESSMENT AND CONTROL OF INDUSTRIAL CHEMICAL SUBSTANCES IN THE LIGHT OF INSTITUTIONAL THEORY

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ABSTRACT

The main objective of this study was to identify isomorphic mechanisms - coercive, mimetic or normative - in the construction of the Brazilian draft law designed to monitor and control industrial chemical substances, in order to promote a reflection on the mechanisms of change that are under way, therefore, addressing some of the challenges in chemical safety governance, health and the environment. Firstly, a bibliographical review is presented on the context of chemical safety in Brazil and in the world, and on the theoretical reference in the field of institutional theory. The study was based on a content analysis of the 16 meeting memoirs of the working group established in May 2014 within the National Chemical Safety Commission (Conasq), to propose strategies, institutional arrangements and the draft legislation. The results were categorized, and there were identified processes and isomorphic pressures that affect the represented entities in the work group, generating, therefore, a preliminary scenario of the institutional situation and its functioning mechanisms that underlie the creation of the new chemical safety legislation.

Keywords: Institutional analysis; Chemical safety; Health and Environment; Legislation.

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1. INTRODUCTION: BRIEF OVERVIEW OF REGULATION IN THE CHEMICAL INDUSTRY

The evolution of the chemical industry from the late 19th century onwards allowed the development of new substances, products and materials aimed at improving daily life experience and bringing socioeconomic advances, such as personal care products, cleaning agents, drugs, food, fertilizers and pesticides, synthetic packaging materials, and a multitude of other goods. However, such advances in the industry have brought about side effects, reflected in environmental, social and human health problems (LI and ANASTAS, 2012). Environmental persistence and frequent or continuous use of these products make it difficult to characterize human and wildlife chemical exposure. The literature on this issue presents evidence of the adverse effects caused by human and environmental exposure to chemicals, although they are present in low concentrations in products and environmental matrices, but are often evidenced in the long term after years of bioaccumulation (COLBORN et al., 1996).

Exposure to these substances occurs, typically, by three exposure routes: through the skin (BRAUSCH and RAND, 2011), through respiratory and oral routes, through ingestion of contaminated food and water (MITRO et al., 2016), or even through the consumption of potable water, since some of these substances are not eliminated in the conventional treatment (Almeida and Weber 2005; Falkinger et al., 2006; GHISELLI and JARDIM, 2007). Adverse effects associated with exposure to chemicals, including those associated with consumer product use, include endocrine and metabolic dysfunctions, reproductive and developmental problems, immunodeficiency disorders, behavioral problems, among others (IPCS, 2012; WHO / UNEP 2013).

Regarding the control and management of chemical substances, several countries have established regulatory structures and instruments to discipline some specific applications and uses for products such as pesticides, medicines and cosmetics. However, many of the substances used in industrial processes are not contemplated in these regulations. This lack of control introduces significant uncertainty about the true extent of the risks of chemicals to environmental health, especially when considering what little is known about the possible synergistic effects they can have on the environment (KORTENKAMP, 2007).

In view of the indivisible nature of the environment and its connection with the economic and social dimensions, several countries, especially the United States, Canada and Europe, have advanced in the discussion of new legislation and in the revision of old norms (ABELKOP and GRAHAM, 2007) in order to define reference values for limiting the use of chemical substances in products, find safer substitutes and, ultimately, ban the use of substances with demonstrated adverse effects or even based on the precautionary principle. These governments aim to structure a legal and institutional framework that supports chemical risk assessment and controls activities, defining institutional competencies and arrangements, formulating national policies and programs to manage the risks associated with the use of these chemical substances.

Following a worldwide trend, in 2016 Brazil prepared the first draft law to monitor and control industrial chemical substances, still subjected to the National Congress approval. The Ministry of the Environment estimates that from 10 to 15 thousand substances produced in the country and imported are placed on the national market and used without any monitoring systems or systematic control by the authorities, a gap that the draft law aims to fill. With a turnover of US\$ 112 billion, chemical companies employ two million people in Brazil, that currently represents the world's sixth largest industry in the sector (PORTAL PLANALTO, 2016). Such representativeness confers complexity to the discussion of the theme, considering the multiple actors and interests involved and the articu-

lation among several organizational spheres, as noted by the document of justification and technical elements related to the draft law (BRAZIL, Ministry of the Environment, 2016):

Opportunities arising from the proper management of industrial chemicals extend to greater acceptance of products and services by consumers, reduction of costs related to the minimization of impacts and recovery of environmental damages, and also represent an opportunity for Brazil to obtain greater foreign investments, especially of countries committed to preservationist measures, resulting from the improvement of the mechanisms of control and inspection of chemical substances.

This paper considers that the growing international pressures, the existence of gaps in the national legal framework for the control of chemical substances and the need to define competences and institutional arrangements for the management of chemical risks create an environment of uncertainties and, at the same time, of search for political and institutional legitimacy, which predicts the occurrence of isomorphic changes in the organizational fields, with reflexes in the guidelines expressed in the new law. Thus, the objective of this paper is to analyze the process of construction of the chemical safety standard in view of the new institutional theory, following the approach of DiMaggio and Powell (2005), from which powerful forces lead organizations to become more similar to each other, including competition for political and institutional legitimacy, as well as market position.

2 ISOMORPHISM IN ORGANIZATION STUDIES

Considerations relating the effects that organizational structures and the institutional environment have on processes, routines and interorganizational relations in search for legitimacy are part of the researches in institutional theory, which has increased over the past 30 years as part of the field of organizational studies (SCOTT, 2008). In a review of the literature, Melo Pereira (2012) observes that institutional theory is studied in theoretical and practical contexts and in several organizational environments, demonstrating that organizations feel the need to standardize behaviors and disseminate organizational identity amongst employees. From the perspective of institutional theory, organizational practices are “regularized and recurrent social actions that continually build and rebuild organization as social system space-temporally delimited” (ALBUQUERQUE FILHO, MACHADO DA SILVA, 2009, 632). Among the different perspectives of institutional theories, DiMaggio and Powell (1991) fit as new institutionalists, aligned with the structuralist perspective, focused on the search for stability, results, domination and continuity of the institutional environment (BARRA, 2017). From this point of view, the perception of legitimacy of an organization is associated to the level of incorporation of institutionalized rules and beliefs by its members and are not necessarily related to efficiency criteria, but to the cognitive and cultural processes perpetuated in the organizational field, that make organizations increasingly similar or isomorphic, according to DiMaggio and Powell (1991). Their investigations start from the concept of isomorphism created by Hawley (1968), which translates this organizational homogenization and propose three mechanisms of institutional isomorphism: coercive, mimetic and normative. Each involves a separate process, but two or more mechanisms can act simultaneously, and their effects are not always clearly identifiable.

Coercive isomorphic change results from both formal or informal pressures exerted by other organizations on which other organizations depend, and also by cultural expectations of society. Sources of pressure include national and international regulations and directives, contractual and technical requirements, conforming to larger institutions and rules, centralization of capital and industrial relations, and state centralization.

Another form of isomorphic organizational change is mimetic, a procedure whereby organizations, consciously or unconsciously, tend to emulate other organizations that they perceive to be more legitimate or successful, thus reflecting their practices. Organizations can mimic each other by transferring or rotating employees or even by the influence of consulting firms and industry associations. According to the authors, copying an organization that seems more successful and legitimate is a response to uncertainty and a way to enhance the legitimacy of an organization because it shows that the organization follows the best practices.

The third type of isomorphic change is the normative, which involves professional entities capable of regulating, enforcing, and negotiating rules and norms in their own interests. For the authors, two aspects connect professionalism in the field to normative isomorphism: a) support for formal education and legitimization and sharing of a cognitive base of professionals, besides technical consensus; and b) the establishment of professionals networks through which new organizational models, norms and working methods are disseminated. For example, when members of a particular professional group try to define methods and practices applicable to a particular situation within the organization to which they belong. In this way, action and decision making are based on similar knowledge and experiences that cross organizations and quickly spread new models, a process well observed in the chemical industry. Hoffman (1999) conducted a comprehensive study on the evolution of environmental regulations within the American chemical industry and concluded that:

Law is the visible manifestation of the relevant actors in the organizational field. Who is authorized to participate in the legal process reflects who possesses a legal voice in determining institutional norms. Law has a direct impact on corporate action and casts a revealing light over which players are relevant in determining such action by providing a formal system for actors to influence each other. (HOFFMAN, 1999, p.11).

Assuming the isomorphism in the chemical industry, in the present study we sought to identify which isomorphic mechanisms prevailed in the creation of a draft law in Brazil for chemical substances - coercive, mimetic or normative - and which sectors set the agenda in order to promote a critical reflection on the shifting gears of institutional changes that are underway and also address the challenges to governance in chemical safety, health, and the environment.

3 METHODOLOGY

To reach the proposed goal, we adopt a qualitative approach. According to Godoy (1995), the qualitative approach has a recognized role among the various possibilities of studying the phenomena that involve human beings and their social relations in the most diverse environments. In the field of social sciences, qualitative research encompasses a set of different interpretive techniques that aim to describe and decode the components of a complex system of meanings (NEVES, 1996). As a research exercise, the qualitative approach does not present itself as a rigidly structured proposal, allowing imagination and creativity to lead researchers to propose analyses that explore new approaches (GODOY, 1995).

In order to make a contribution in the study of this subject, we used content analysis as a method to investigate the 16 memoirs of the meetings held by the working group "GT Regulation of Chemical Substances" established and appointed by the National Chemical Safety Commission (Conasq) to draft the law on industrial chemical substances during the period from May 2014 to December 2015. The Working Group (WG) aimed to:

Discuss and propose strategies, institutional arrangements and the draft legislation to establish the control of public power over the universe of chemical substances that are currently placed in the national market without an assessment of their risks to the environment and human health. (BRAZIL, Ministry of Environment, 2016)

Content analysis provides a method for systematically evaluate and categorize data by encoding and identifying patterns. The present analysis was organized around three stages: 1) pre-analysis; 2) text exploration; 3) treatment and interpretation of results (BARDIN, 1977). In the pre-analysis stage, were carried out floating readings of the memories of the meetings of the working group, in order to know the context of the discussions on the subject on chemical safety and to grasp and organize in an unstructured way important aspects for the next phases of analysis.

For the selection of the registration units, we highlighted segments of the text that could be characterized as an event of interest to our research objective, as proposed by Bardin (1977). Such segments are related to individual remarks of the representatives of the organizations in the working group and also to general comments without any specific institution defined. Those segments were, then, classified according to the three mechanisms of institutional isomorphism based on DiMaggio and Powell (2005): coercive, normative or mimetic. For the content analysis of the reunion memories, the corpus of texts was interpreted only in light of the coding framework, although it may be connected to a variety of other issues. Among the pros of an a priori categorization, Campos (2004) points out the convenience of keeping track, which allows the researcher to directly classify his units of analysis within these categories. On the other hand, pre-defined categories can limit the verification of contents that are not covered in these previous categories, limiting the analysis. Finally, during the treatment of the results and interpretations, the pertinence of the categories in question was verified for the construction of the draft law of industrial chemical substances and the relation of the categories with the participants of the WG and its respective institutions, with the objective of identifying which isomorphic aspects predominated and which groups had more representation in the discussions, generating, therefore, a preliminary scenario of the institutional situation in chemical safety and its functioning mechanisms.

Considering that the qualitative analysis seeks to capture meanings in the subject's speeches, associated to the context in which they are inserted and delimited by the theoretical instrument of the researcher (ALVES and SILVA, 1992), it was chosen to highlight in the results segments of texts representative of the categories of analysis.

Representatives from the public, private sector, civil society and workers from the following institutions participated in the working group: Ministry of Environment (MMA, group coordinator), Ministry of Industry, Foreign Trade and Services (MDIC), Ministry of Health (Ministry of Mines and Energy, Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), National Agency for Sanitary Surveillance (Anvisa), Jorge Duprat e Figueiredo Foundation (Fundacentro), Brazilian Chemical Industry Association (Abiquim) Central Única dos Trabalhadores (CUT) and the Brazilian Forum of NGOs and Social Movements for the Environment and Development (Fboms). In some cases, more than one representative from the same institution was present.

4 RESULTS

The results presented below are organized according to each classification category (normative, coercive and mimetic). Relevant segments from the analyzed material were highlighted.

Table 1 – Number of reference units classified by category of isomorphism and entity

	Coercive isomorphism	Mimetic isomorphism	Normative isomorphism
Abiquim	–	21	12
General comments from the WG	1	3	3
Fboms	–	–	1
Fundacentro	4	10	6
Ibama	1	1	–
MDIC	–	1	4
MMA	2	6	–
Total	8	42	26

Source: Elaborated by the authors.

4.1 Coercive isomorphism

Eight segments of text that fall into this category were identified along the analyzed memories: 1 associated with a general comment from the WG; 1 associated with the representative (s) from IBAMA; 2 associated with the representative (s) from MMA; and 4 associated with representative (s) from Fundacentro.

Concerning the general comment from the WG, participants agree that there are increasing pressures on countries to better manage chemicals by means of specific federal legislation. Important international milestones, that act like source of pressure, include Agenda 21, adopted at the United Nations Conference on Environment and Development (Rio 92), which emphasizes the importance of national and international strategies for the safe management of chemicals, including the creation of legislation and appropriate implementation mechanisms to bring it into effect.

Much remains to be done to ensure the ecologically sound management of toxic chemicals within the principles of sustainable development and the improvement of the quality of life of humankind. Two of the major problems, particularly in developing countries, are: (a) the lack of scientific data to assess the risks associated with the use of numerous chemicals; and (b) the lack of resources to evaluate chemicals for which we already have data (AGENDA 21, Chapter 19).

For the management of these products, the document proposes six program areas: a) expansion and acceleration of the evaluation of the risks of chemicals to health and the environment; b) harmonization of the classification and labeling of chemical substances; (c) exchange of information about the risks of chemicals; d) organizing risk reduction programs and promoting alternatives; (e) strengthening of national capabilities and resources for the management of chemicals; (f) prevention of illegal international trafficking of toxic and dangerous products (UNCED, 1992).

Other important milestones in the international scenario that contributed to the advancement of both Agenda 21 in Brazil and the chemical safety agenda include the Johannesburg Summit (Rio +10) - which reiterated the agreements reached in Rio-92 and established the commitment for countries to develop their chemical management systems by 2020 - and later in 2006 the first International Conference on Chemicals Management (ICCM-1), which has led to the Strategic Approach to International Chemicals Management (SAICM), which recommends actions for the formulation of policies aiming to promote the management of chemical substances among the signatory countries.

From the standpoint of coercive isomorphism, all these international milestones refer

to the formal pressures exerted on organizations, thus, in the case of the Brazilian government, to create a legal framework focused on the management of chemical substances. Coordinator of the meetings of the chemical safety WG and director of Environmental Quality of MMA, Leticia Reis pointed out that the main topics of The United Nations Environment Assembly (UNEP) that she took part in were the products chemicals. According to her, “there will be sources of international funding for the Chemical Safety agenda”. These funding used to include only persistent organic pollutants (POPs) and now also covers the entire chemicals agenda. Regarding internal pressures, Alberto da Rocha Neto, another representative from MMA commented that the entity that he represents wants to be aware of all the substances that circulate in the country: “Knowledge is important for government control and even international relations”.

Coercive isomorphism results from formal and informal pressures exerted on organizations by other organizations that they depend on, and by the cultural expectations of the society in which the organizations act (DIMAGGIO and POWELL, 2005). This movement can also be observed in the contributions of the representative from FUNDACENTRO, Gilmar Trivelato, who pointed out issues related to the treatment given by the labor area to the use of chemicals in work environments, citing international legal frameworks and expectations of the Ministry of Labor and Employment of Brazil (MTE): “It is important that labor legislation related to chemicals - ILO Conventions, Convention 170 - be analyzed, as this is applicable to all economic activities in which chemicals are used”; “In terms of scope, the Ministry of Labor recommends that all products used in the work environment to be classified”; “For the MTE every product that can be used in work environment needs to be analyzed, signed and have a label informing about its safe use”.

Despite the low incidence of the coercive aspect of isomorphism in the memoirs from the WG meetings on chemical safety, it is understood that the role of this mechanism in the genesis of the draft law is decisive in view of the growing national and international pressures and expectations that end up imposing organizational changes.

4.2 Mimetic isomorphism

During the WG meetings, both national legislations and programs of other countries concerning management and control of chemical substances were analyzed, in order to verify possible instruments and structures that could be applied to the Brazilian reality, which signals a process of mimetic isomorphism. DiMaggio and Powell (2005) understand that organizations assume mechanisms of mimetic isomorphism in the face of: a) problems that they can not solve on their own; b) poor organizational technologies; c) environmental uncertainties. Seeking legitimacy, they would end up implementing processes and practices similar to those implemented by organizations seen as better positioned or more successful.

Altogether, the analysis identified 42 registration units that fell into this category: 21 assigned to the representative (s) from Abiquim; 10 to the representative (s) from Fundacentro representative (s); 6 of them to MMA; 3 to general comments of the working group; 1 to the MDIC representative (s) and 1 to the representatives of IBAMA. Next, we present the main signs of mimetic isomorphism in the discourses of these entities.

Abiquim

- Abiquim was the organization that most demonstrated a tendency to mimic practices and regulations of international organizations. Often at WG meetings, the entity

discourse tended to be based on pre-existing models. At the first meeting, Nícia Fusaro Mourão, manager of regulatory affairs and sustainability of Abiquim, showed a presentation titled “Regulatory Intelligence: alternatives for the safe management of chemical products in Brazil”, seeking to elucidate the main points of operation of REACH (Registration, Evaluation, Authorization of CHEMicals) – the European chemical control system and Challenge, the Canadian system. For the representative, “we should use as an example the legislation that already exist in the world.” Her speech expressed concern regarding expenditures to implement the regulations. “As we are going to rely on knowledge from other countries, we should really rationalize these scopes to avoid unnecessary spending, too much information, no use, etc.” The advantages of mimetic behavior in terms of saving time and human resources are considerable. When an organization is faced with a problem with ambiguous causes and unclear solutions, a problematic approach can yield a viable solution with few expenditures (CYERT and MARCH 1963, DIMAGGIO and POWELL, 2005, p.78). At the following meetings, the Abiquim representative presented the criteria adopted by the European Union to classify chemical substances and their danger scales in an attempt to guide the scope of the Brazilian draft. Some relevant units from the memoir that demonstrate this behavior are highlighted below:

- “According to Nícia (Abiquim) ... the criteria for the identification of hazardous substances should follow what has been a good practice in international legislation today, such as REACH, which focuses on chronic health and environmental human health hazards since acute hazards will be controlled in the workplace “.
- “... reported that the chemical substance is registered in REACH, but neither the mixture nor the goods are registered. Although they are not registered, the GHS determines the classification of both substances and mixtures, and REACH has adopted the GHS as a system for the labeling and classification of hazardous products. Goods do not enter the GHS. Eg a plastic chair “.

GHS is an acronym in English for Globally Harmonized System of Classification and Labeling of Chemicals, an international system for the definition of hazards of chemicals and creation of harmonized classification processes. Of particular importance for the preparation of the draft was the definition of the terms “mixture” and “substance” and the need to arbitrate a limit value, as provided for in any regulatory decision. The representative from Abiquim once again cited as reference the European Union: “For REACH, the minimum concentration limit usually adopted is 80% of a substance in the reaction mass; above that limit it is considered a pure substance. Water in any proportion does not enter as a composition-altering agent, so if one has an acid, for example as less than 80% of the composition and the remainder is water, it is still considered a pure substance for REACH”. The European legislation also subsidized discussions to define which substances would fall outside the scope of the law. With regard to products of mining activity, for example, the representative clarified that “mining is only extracted and not processed. In REACH, there are no registrations for these mineral products when they are marketed only *in natura*. If there is a chemical transformation, it is necessary to be registered in REACH”. At one point, the representative from Fboms, Zuleica Nycz, suggested that the bill also include nanomaterials, whose application in cosmetics, pharmaceuticals and other products has generated concern regarding environmental health. In this regard, the representative of Abiquim expressed her disagreement, since “other countries are not dealing with nanomaterials under the general laws of chemicals, but in separate and specific stand-

ards.” In order to speed up the registration process, the representative from Abiquim informed that Abiquim has 975 companies in the chemical sector mapped, representing 90% of the Brazilian production and that “we should take the data that already exist to save time with the process.”

Regarding institutional responsibilities for the evaluation of chemical substances, the WG proposed the formation of a technical committee with the function of selecting and evaluating industrial chemicals listed in the register regarding their risks to human and environmental health. In this regard, the representative from the Ministry of Labor and Employment suggested the participation of the government agency as part of the technical body, a proposal that was also influenced by isomorphic pressures of mimetic nature. “Abiquim and MMA reported that in Canada only the health and environment sectors are responsible for the management of the chemicals, but socio-economic aspects and occupational health are taken into account.”

In view of the above, it is noted that the representative of Abiquim works intensely with the mimetic perspective. It is assumed that such behavior is due to the search for legitimacy for the entity in the market. Moreover, the interaction of the Brazilian chemical industry with the international market and the contact with practices of leading companies in the field can also contribute to accentuate the mimetic isomorphism mechanism.

Fundacentro

Another 11 segments with mimetic characteristics were credited to the representative from Jorge Duprat Figueiredo Foundation for Safety and Occupational Medicine (Fundacentro), linked to the Ministry of Labor and Employment, Gilmar Trivelato. Like Abiquim’s representative, Fundacentro’s representative believes that the existence of certain internationally adopted practices should help Brazil to define its new institutional framework in chemical safety. According to him, “the work of classification of chemical substances in Brazil will be facilitated because, internationally, there is already a harmonized relationship of classified substances, such as CLP (Classification, Labeling and Packaging), which is the internalization of the GHS in the European Union and therefore, Brazil, besides not being innovative, could make use of data that have already been produced and are available in other countries. “

Regarding the use and production of chemical substances, the representative proposes that Brazilian regulation should have the same scope as REACH, adopted by the European Union, and GHS, in which finished products that have intentional human exposure have specific regulation. Following this reasoning, cosmetics, medicines and pesticides would be outside the scope of the draft, but, according to Trivelato, the substances used in their manufacture should be controlled. Also on the basis of the regulations of the European Union and other countries, the representative submitted proposals for definitions to be included in the draft law regarding the terms “chemical substances”, “mixtures”, “impurities”, “additives”, “chemicals”, among others.

As regards the limit on the volume of production and imports of substances for which companies are obliged to report in the inventory, the representative again relies on external references: “In the European Union, for example, this cut is 1 tonne / year, ie those who produce or import less than that have no obligation to register with REACH, unless the substance has dangerous characteristics. “

Internal practices of other Brazilian agencies also guided the position of Fundacentro’s representative. As a starting point for the creation of a national register of chemical substances, for example, he suggests that “the Federal Technical Registry (CTF-Ibama) can be mirrored and adapted to the needs of building a new register for inventory and control properly regulated”, as had also been suggested by Abiquim’s representative.

MMA

As in the speeches of the two previous entities, mimetic isomorphism was also present in the contributions of the representatives from the Ministry of the Environment during the meetings of the WG. According to Alberto da Rocha Neto: “The fact that the CTF is already a consolidated system, whose completion is already mandatory, could facilitate the approval of the law and the reduction of costs associated with its implementation.” He also presented the idea of holding a seminar with representatives of other countries that have already structured or are structuring chemical safety systems, with the possibility to hold a parallel workshop on the subject.

During the discussions on the terms of registration and evaluation of chemical substances, MMA was tasked with “seeking in European and Canadian law the values used to determine whether a substance has characteristics of persistence, bioaccumulation and toxicity. “The representative of the entity, Marília Almeida, also said that “ we can think of a way to also adopt a more specific control over the most dangerous substances, in the way that REACH does for substances of very high concern.”

General comments of the WG (no defined entity)

The search for international benchmarks to direct the draft for the national chemical bill was the main point of consensus among participants. In a brief summary of the discussions arising from each WG convergence point, the “importance and necessity of using references and data available on the international scene” appears first, and it is suggested “to add at the end of the sentence the excerpt ..” “... from admittedly reliable sources.” With this, the group decided to compile “reliable sources, preferably with the potential of each one” in order to “describe how to use the official databases of other countries and how to insert [those information] in the bill to guide those who will be regulated, to prepare guides, among other actions. “

It is also reported in the memo that, in order to deepen knowledge about regulation in other countries, a comparative study between the chemical management models adopted in the European Union, Canada and China, was carried out by an international consultancy contracted by the action “Control and Regulation of Chemical Substances” within the scope of the Sector Dialogues Project.

MDIC and Ibama

The representative of the Ministry of Industry, Foreign Trade and Services (MDIC), Marcus Simões, suggested “to use the list of 200 substances identified by Canada as concern and to internalize it in Brazil as priorities for the adoption of specific control measures”, “with the aim of clarifying the national scenario and guiding the decisions of the WG”.

Also focusing on the external benchmark, IBAMA’s representative, Karina de Oliveira Cham, argued that the register covers all substances, citing the example of Canada “in which all substances undergo environmental assessment, either by specific chemical, environment or health legislations.”

4.3 Normative isomorphism

The content analysis of the WG memories revealed 26 reference units for this category: 3 associated with general comments from the WG; 6 associated with Fundacentro; 12 related to Abiquim; 4 to MDIC and 1 to Fboms.

General comments from the WG

Among the general comments attributed to the WG, we identified 3 reference units that fit this category of isomorphism. Regarding the structuring of national legislation and institutional arrangements for the management of chemicals, including measures for the allocation of needed resources, WG participants mention that:

- “It is necessary, in addition to a standard for the control of chemical substances for industrial use, to build a National Chemical Safety Policy, associated with the strengthening of CONASQ, for the full development of more strategic actions”
- “The Guide to Developing Legal and Institutional Infrastructures for the Safe Management of Chemicals and Cost Recovery Measures of the National Administration” is a tool that guides countries in how create structures to formulate their internal policy on the control of chemicals, including financial mechanisms for cost recovery.”
- “All WG institutions should systematize, within their area of competence, the importance of this law and how it could be applied in its context, that is, the institutions perspective with this law, mechanisms that should be created and what would be the competencies of each institution”.

Fundacentro

Based on the analysis of the WG meetings’ memories, the six reference units that fit the normative isomorphism category were associated with Fundacentro linked to the Ministry of Labor and Employment (MTE). Representative Gilmar Trivelato advocated for the implementation of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), which he said “is the basis for the management of these products.” He also noted that “it is necessary to generate many guides and supporting materials to assist the regulated sector in complying with the standard.” More than once he highlighted the importance of the subject for the entity that he represents, mentioning Fundacentro’s intention to participate in the evaluation of the regulations under construction: “The Ministry of Labor and Employment is willing and open to evaluate the regulatory norms related to the control of substances where necessary, in view of the supervenience of the proposed legal framework “; “Fundacentro also understands that the bill must address substance-related hazards throughout its life cycle, including the work environment.” In the opinion of the representative of Fundacentro, there is no way to exclude concern for health and safety in the workplace, “because the GHS also applies to this exposure scenario.”

The normative isomorphism was also observed in two of the main points of disagreement of the WG: one of them deals with the creation of the technical committee for the evaluation of chemical substances (with the function of selecting and evaluating, regarding the risk to the environment and to human health, the industrial chemicals listed in the register); the other point refers to the institution of the deliberative committee of chemical substances, responsible for the implementation of the measures of risk control. Regarding this second point, the Fundacentro’s representative stated that “the federal agency responsible for the” work sector should be part of the list of institutions that will be responsible for selecting the most dangerous substances and establishing risk control and management measures, conditions laid down in the PL “. He also commented that regulations concerning the working environment are the sole respon-

sibility of the MTE, and that, therefore, the ministry should be represented on the committee. The proposal was not unanimously accepted by the WG, to which the representative expressed displeasure, noting that “the formal position of Fundacentro and the Ministry of Labor and Employment is that the labor sector be represented in the said Committee.”

Abiquim

The analysis of the texts revealed 12 reference units of normative character associated to Abiquim. In discussions on the definitions of the terms product, element and chemical substance, the Abiquim representative has repeatedly suggested that the new regulation should use a term that “is understood by industry and government.” To identify chemicals, Nícia Mourão proposed that their CAS number be used (a unique registration number assigned to the substances in the Chemical Abstracts Service database, a division of the Chemical American Society), which is used internationally. “Every substance has a CAS number and also many of the so-called products. So it’s worth it to base ourselves on this classification.”

According to the memory of the WG meetings: “Ms. Nícia Mourão suggested that anything with a CAS number be considered as a substance for the scope of the PL, as this would facilitate the work, since we would thus be working with known chemical substances. “ Currently, according to the representative, there are more than 81 million organic and inorganic substances registered in the CAS database, and approximately 15 thousand new substances are registered daily.

The WG also debated intensely whether the inventory should contain the mix register or only the substances composing them, since many mixtures do not have a CAS number. Abiquim’s representative “also reported that many companies that import chemical substances do not receive from the exporter the information about the composition of the mixture, because it is a secret and is under a fancy name, given the formulation being a business secret.” He further emphasized that “if exporters of blends are required to provide their formulations they may no longer sell to Brazil.” Concerned about possible limitations in the trade sector, the representative argued that the register contain only dangerous substances that make up the mixtures of imported products, not all the substances in the composition. According to her, “there is the importer that brings the product that competes with the national ones and the one that imports them to use in its production without there being a national similar, in that case, there should be no barrier to importation.”

In order to facilitate the construction of the Brazilian inventory of chemical substances, Abiquim’s representative made a presentation on the Mercosur Common External Tariff (TEC) and on the composition of Mercosul Common Nomenclatures, which make up mainly the chemical industry.

There was also intense debate over whether it would be sufficient to name the “chemical control” legislation excluding the term “industrial use”, to which the representative of Abiquim reported that she would consult its legal advice regarding the definition and delimitation of the term “industrial use” . In the discussions on possible penalties to those who does not fulfill the demands established in new law, the representative resorted once again resorted to legal advice from Abiquim, once again pointing to normative isomorphism.

In another movement related to professionalism and isomorphism, the representative demonstrated support for formal education and the creation of a platform for sharing practices, proposing a “support organization and the need to train specialists at all levels”. In this regard, she has shown particular concern for small businesses: “A government program is also needed for small businesses, including, mainly, formal training”.

The need for formal training to make organizational transformation successful proves to be a strong indicator of normative isomorphism. The representative of Abiquim argues that “it has to give companies responsibility to bear the contained knowledge”. She recalled, however, that there is an agreement between the companies of confidentiality and that she would check internally what can be provided. Attentive also to the *modus operandi* of the sector, Nícia defended that the “initial register should not contemplate information of possible uses of the substances, which should happen in a second moment, because it is very difficult for the companies to find out for what the substances sold will be used by those who buy them.” It is observed, therefore, that the normative isomorphism is very present in the suggestions of the representative of Abiquim, possibly due to the intense participation of the chemical sector and the Association that represents it in the international market

MDIC

Normative isomorphism was also verified in the discourse of the representative from the Ministry of Industry and Foreign Trade, Marcus Simões. Four reference units were identified for this category. Like other participants, the representative from MDIC said “it is necessary to develop a nomenclature concept for the national inventory and to align the customs classifications.” Regarding the issue of differentiation of obligations between importers and producers, defended by Abiquim, Simões (MDIC) stated that there should be no distinction between requirements to the domestic producer and to the importer, noting that “the chemical sector is going through a critical moment of participation of imports” and that “it is an important moment to reflect on the creation of a technical barrier that helps the domestic producer against unfair competition with poor quality imported product”. According to him, “any possible administrative obligation that reaches the importer of chemical substances and that is created by the new law would need to be extended to the domestic market (producers and buyers), so that there is no violation of the WTO National Treatment (World Trade Organization). “ It is noted that the representative seeks to legitimize his organization by acting reliably, complying with laws, norms and rules.

In another moment, Roberto Loureiro Filho, also a representative from MDIC, requested the inclusion of the sector “industry and foreign trade” among the institutions that will be part of the commission responsible for selecting the most dangerous chemical substances, noting that “it will be necessary to carry out socioeconomic analyzes (impact on the industrial sector, jobs and foreign trade) that should parameterize the selection of substances “. There was disagreement on this point. Representatives of the Brazilian Forum of NGOs and Social Movements for the Environment and Development (Fboms) and the Central Única dos Trabalhadores (CUT) highlighted their concerns about the inclusion of the industry sector and foreign trade, justifying that “the processes of selection of the substances and establishment of risk control and management measures could be influenced politically, prioritizing the conclusions of the socioeconomic analysis over environmental and health concerns. “ In defense of his organization, the MDIC representative replied that “the socioeconomic analysis should address important points, such as the possible impacts on the sector, impacts on jobs, need and feasibility of replacement of technologies and raw materials, regional development”, adding , that the Ministry carries out its activities “taking into account not only aspects of industry and foreign trade, but also those related to work, environment and health.” The inclusion of the industry and trade sector in the group that will define the substances to be controlled was supported by the Abiquim representative.

Fboms

In the same way that representatives from Fundacentro and MDIC defended the inclusion of their organizations in the chemical management committees, the representative of the Brazilian Forum of NGOs and Social Movements for the Environment and Development commented that “civil society should be represented in the list of institutions “. The comment was rejected by the representative of the MMA, Alberto da Rocha Neto “because it is an imminently state-regulated activity and that civil society sectors are present in other forums, such as Conasq, and that the sectors are represented by the respective sectoral ministries”.

5 FINAL CONSIDERATIONS

The aim of this article was to identify the motivators for the creation of a draft for a national law on industrial chemical substances, which provides for registration, evaluation and control of industrial chemical substances. The analysis of content of memoirs from the working group established in the framework of the National Commission on Chemical Safety revealed the existence of a link between the three mechanisms of isomorphism - coercive, mimetic and normative - in the construction of the new legislation. The weight of each mechanism, however, varied both in relation to the topics covered and in relation to the needs and interests of the institutions that integrated the WG. Based on the institutional approach, which shows that organizational values and interests prevail, it was noted that the chemical safety agenda was largely guided by mimetic isomorphism, amid a scenario of growing uncertainties and regulatory concerns.

Throughout the meetings, the Brazilian Association of the Chemical Industry (Abiquim) was the organization that most acted with the mimetic pillar, mainly in relation to international practices, in order to legitimize itself through a reliable performance, considering that the constant interaction with the international environment by the Brazilian chemical industries facilitates the flow of information as well as the adaptation of international practices to local realities. It is followed by the Jorge Duprat Figueiredo Foundation for Safety and Occupational Medicine (Fundacentro), linked to the Ministry of Labor and Employment, and by the Ministry of Environment. Together, these organizations eventually guided the WG in the quest for legitimacy through context-oriented action lines, rules, and institutionalized meanings and practices in the chemical industry. Thus, the mimetic mechanism was the most preponderant in the construction of the draft on chemical safety regulation. In second place appears the normative isomorphism, with its formalism that homogenizes and institutionalizes criteria, definitions and norms in search for legitimation. Abiquim, Fundacentro and the Ministry of Industry, Foreign Trade and Services were the three organizations that most evidenced this mechanism.

In third place is the mechanism of coercive isomorphism, as evidenced by increasing environmental pressures and management trends in chemical safety, as well as in international frameworks, such as Agenda 21, the Johannesburg Summit (Rio +10), and the Strategic Approach to International Chemicals Management (SAICM).

For DiMaaggio and Powell (2005), since the effect of institutional isomorphism is homogenization itself, the best indicator of isomorphic changes is the reduction in variation and diversity, which can be measured by lower standard deviations in the values of selected indicators in a group of organizations. The present study found that, despite the complexity of the chemical safety issue, there were few divergences in the WG, and when any proposal deviated from the isomorphic standard, it was quickly rejected, as when the representative of the Brazilian Forum

of NGOs and Social Movements for the Environment and Development has suggested the participation of civil society in chemical substance management committees and the inclusion, in the scope of substances to be regulated, of nanomaterials, whose application in cosmetics, pharmaceuticals and other products has generated concern from the point of view of environmental health. In the light of the theoretical perspective adopted, inasmuch as pluralism is a guiding value in public policy deliberations, it is necessary to promote forms of intersectoral coordination that encourage diversification rather than hasty homogenization.

The smaller insertion of crucial sectors for the debate of the issue, such as the health and the environment sector, are another point of concern in view of the complexity nature of the issue, which has wide and indiscriminate effects in these fields. The result of this administrative fragmentation, according to political scientist Neil Carter, is that policies implemented do not reflect the complexity of socio-environmental interactions, but rather the corporatist interests of economic agents that are protected by the respective government sectors (Carter, 2007). From the analysis of the material, it was also verified that the debate was strongly permeated by a technocentric perspective, which does not live up to the complexity of the risks and uncertainties associated with chemical substances that expose the whole community.

With these aspects in mind, this research sought to contribute to the organizational studies related to the advancement of the chemical safety agenda in the country. Although the issue has generated demands and responsibilities for the Brazilian government and public managers, and the response to the challenge has come in the form of movements focused on the expansion of regulatory measures, a question remains open: since isomorphism does not always lead to greater efficiency, do these changes, in the way they have been happening, actually promote better management of the risk of chemicals in order to reduce threats to human and environmental health or are they represent only mechanisms of isomorphic protection? This is a question that is posed for studies on chemical safety and environmental governance, and whose answers demand critical analysis of the institutional mechanisms that are in the genesis of national regulations. In this sense, other theoretical-analytical approaches, such as those of social theories of risk, may offer valuable interpretations for the understanding of these processes.

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