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AGENDA 2030 COMPLIANCE:
COMPANIES, INSTITUTIONS
AND NANOTECNOLOGIES**



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ABSTRACT: In this global hipecomplexity scenario, developing countries are called upon to contribute a portion of the reduction of these complexities in order to the sustainable development described in Agenda 2030 to be fulfilled. Around Brazil, there is the expectation that this contribution will be significant in view of the fortunate territory it occupies. However, such targets are far from being achieved by the country in face of its poorly developed system and this is a problem for the research. The general objective is to demonstrate that these are two flawed sides of the same coin: the internal, because of little systemic understanding of global communication that includes the role of institutions and new technologies; owing to the low contribution and lack of management of this global systemic communication that goes beyond resources provided in developing countries. As specific objectives, the research intends to demonstrate that this scenario is due to the low national production complexity characterized by trade in goods and services by 80% of the brazilian companies, distributed among small and medium enterprises, which, in turn, are not involved in planning and technological development, with special attention to disruptive nanotechnologies; as a consequence do not contribute to the sustainable development set out in agenda 2030. The initial hypothesis assumes two aspects: for the internal system, the contribution of sectoral institutions in the diffusion of communication involving technological innovation and sustainable development; and, for the global system: direct engagement in the management of resources and in the construction of this systemic communication. The methodology of the research is deductive and adopts the systemic-constructivist perspective as a procedure to arrive at the solution. The research techniques go through the collection of data and documents submitted to the analysis through the bibliographic review.

Keywords: Agenda 2030; System Theory; Communication; Management; Nanotechnologies.

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1 Introduction

Globalization provides a hypercomplex scenario of network interactions, for the benefit of present and future generations, especially in the case of sustainable development, as a goal of the Global Agenda for 2030, whose consequences are the distribution of the same responsibilities to all, regardless of developed or developing country. All are engaged in the same systemic understanding because imbued with the same communication of meaning.

Based on this systemic communication pattern marked by the language of sustainability, the proposal of the most developed ones to assist the developing ones in a fast and coordinated way, in order to reach the established level and at the same time, fulfill the indicated goals.

However, establishing the communicational pattern capable of linking chain and network commitments, developing countries face innumerable internal difficulties peculiar to the development process, which present themselves as obstacles to the promotion of the results pursued by sustainability, capable of hampering the gearing; prevent, procrastinate or postpone the results, which are closely related to the efficiency or not, of the management of this process. These results, as a diagnostics, a systemic sharing by the failure of Western global endeavor and a problem for research to solve.

Part of this process of proper management of the complexity of the system is transferred to the companies because they have the capacity for development and innovation and, consequently, occupy a prominent position in the sustainable economic production that has as a corollary, the promotion of the economy of the well-being characterized by the best distribution of wealth to a larger number of people included in the consumer Market. That is, there is a direct equivalence relation between company and complexity; the same way that there is between technology and sustainable development.

But for companies to fulfill this role, it is necessary to promote development; leverage innovative planning and development through new technologies. There is no increase in complexity in a country without technological and industrial development. And, once there is an increase in internal complexity, there is automatically a contribution to reducing the hypercomplexity of the overall system.

The way to make this phenomenon feasible and to reach a significant contribution by developing countries in the medium and long term depends on the shared management of this communication process and the stimulation of new Technologies. Such shared management, in turn, must be effective: planning, investments, management, collection and analysis of

results and new technologies should be the banner of development, including public investment policies, especially nanotechnologies, disruptive⁴ in nature.

Therefore, the research has a problem the following question: why Brazil is having difficulties in implementing in the economic system operated by Brazilian companies the positive externalities set out in agenda 2030?

As an initial hypothesis, for the internal system, the contribution of sectoral institutions in the diffusion of communication that stimulates technological innovation and the premises of sustainable development can lead the business environment to a stage of greater complexity in national production; and for the global system: direct engagement in resource management and the construction of such systemic communication is likely to ensure successful distribution of complexities and compliance with Agenda 2030 ODS.

In so being made operational, developing countries are likely to advance in meeting commitments and delivering results to the sustainable development goals (ODS) set out in Agenda 2030, which is limited to the aspect of economic development.

In order to achieve these results, the general objective of the research is to demonstrate that this systemic process of globalization has two flaws: in the domestic aspect of the country, because of the lack of systemic understanding of global communication about the reduction of complexity and sustainable economic development; on the external side, there is a little contribution and a lack management of this global systemic communication that goes beyond resources provided in developing countries. There is a management vacuum to be filled by efficient systemic activity: a sharing of management and effectiveness beyond political discourse.

As specific objectives, the research aims to demonstrate: 1) that the internal scenario has little complexity because it does not produce technological innovation and, therefore, it does not promote the sustainable economic development that is based on planning, development and innovation; 2) that this complexity is due to the profile of the economic system in its business program, trade in goods and services; 3) that this profile is practiced by 80% of Brazilian companies, distributed among small and medium enterprises; 4) that such Brazilian companies are not involved with planning and technological development, with special attention to disruptive nanotechnologies.

In order to pursue these results, the methodology will be deductive and will start from the particular observed to achieve, under a general perspective, systemic contribution, whose

⁴ The term is used as synonymous with technologies that are capable of transforming the cultural and social environment where they are applied; are even able to change behavior.

procedure has a Niklas Luhmann's Theory of System (1927-1998), the theoretical basis for observation, diagnosis and prognosis of deductive process.

The reader can understand that the luhmanian sociological theory works from the systemic observation. The system, in turn, is understood from a comunicacional complex of interactions. The result of this observation enables the observer to diagnose the problem and propose the construction of a practical solution, systemic-pragmatic solution. It is, therefore, from this theory the understanding that Society (the social system) is divided into subsystems, such as the legal, economic, cultural, educational, political systems; all of them have their own identity that characterizes them and above all, that differentiates them from the others, either by the individual language built in its structure or by the operations they perform capable of modifying the environment from the results they promote.

Thus, it is known when the economic system is operating because its language patterns are very particular to its system of supply and demand, cost-benefit, transaction value; it is known when the legal system is in operation when it has contact with the decisions of the Courts; it is known when the political system is in operation when there are news of discussions for democratic validations, partisan ideologies, voting on bills, and so on. In turn, the social system has a psychic complex that manifests itself in pattern of cultural and communicational behavior that differentiates it from others. (LUHMANN, 2010)

This identity, in turn, is particular to each system, is protected by structural and operational closure in relation to the others and because of this it is possible to differentiate one from other, identified by Luhmann as funcional structuralism (LUHMANN, 1990); with this characteristic structure of each subsystem is that self-referenced processes are initiated to maintain strongest which, in turn, guarantees the articulates functioning of the whole of the social system. The whole environment united in a single system composes the social system. Everything that escapes the particular funcional structuralism of the subsystem is understood as environment because the perspective is that the system itself in relation to the whole.

The relation between systems is, according to Luhmann, marked by hypercomplexity understood as being the volume of interactions, of relations of infinite possibilities of communication between systems, and for this reason, in the face of this informational and communicational chaos, there remains a need to reduce-over there; select it. In order to reduce this hypercomplexity, there is a need to increase the internal complexity in each system, and for that to happen, in contrast, there must be relations of reciprocal and communicational interdependencies absorbs them internally depending on the irritation suffered, inserting them into its structure capable of midifying the respective operations. This gives rise to the

phenomenon of structural coupling. This represents systemic Evolution and development of the social whole.

Structural coupling is the result of environmental inputs⁵ in the structure. However, when the inputs are absorbed, their functional differentiation is increased from evolutionary processes that reflect in their systemic operations as results, that is, outputs⁶, and closes again, maintaining its identity (LUHMANN, 1990; 2010). It is the closing-opening paradox that permeates the theory and makes the functioning of the system dynamic and constant, approaching the surrounding reality.

Thus the operations of the economic system are capable of generating externalities, that is, results that affect directly or indirectly, the environment or the other subsystems. Once the complaint has been diagnosed, it is possible for the system to receive this irritation, select it and internalize it in its structure in order to modify its operations, contributing to the systemic whole. This is the evolutionary process of system arising from communicational processes. By the way, externalities can be positive or negative.

Therefore, the more advanced the more organized systems are the communicational processes to make viable a significant contribution to the increase of the internal complexities of each system and reduction of the external ones, being this benefit for the Society. These communicational processes are difficult to devise and succeed and depend on the time between observation, input and output, which is depend on system selection.

However, systems depends on communication to evolve and if it is interesting to go through the selection filter and to incur the structural coupling by the selective system by a series of factors that not only the internal program of the system, evolution will occur, but this is depend on the time and risk allocated within the structure and operational processes. The systemic structures are reversible, but the processes, once consolidated in the surroundings, are irreversible. The structures are reversible because they are open to selection possibilities. Already, processes do not return in time because they deal with irreversible concrete events.

From this it follows that system has its own structure and operations that can coordinate all the elements that it produces and reproduces in order to potentiate the

⁵ *Inputs* are external irritations from the system observation point environment and must be coupled by the system to increase its internal complexity and reduce the external complexity. An example of this can be shown with the demands for social responsibility within the economic system; economic decision-making based on ethics; the coupling of economic issues by the legal system etc.

⁶ *Outputs* are the operations with greater complexity that the system performs after undergoing a process of irritation and structural coupling of the inputs processed internally and that reflect in the environment.

selectivities and regulate its own autopoiesis⁷. In the body of the structure there are conformities and deviations; in the body of the processes, there are probabilities and improbabilities. (LUHMANN, 1990; 2010)

Then, from the perspective of application of the theory in the present research, it is stated that the economic system, which is operated by the business program, is little complex and needs irritations to evolve. It is not very complex because, besides promoting negative externalities as a result of its operations, increasing the margin of exclusion of access; not increase the quality of life and distribution of wealth, likewise does not receive such externalities to evolve its structure and operations, such as violations of social and environmental ecosystems; perhaps, to modify its structure, language and operations from the Federal Constitution, which for this system, also represents externality not computable in development.

The economic system is therefore dependent on the evolution of companies so that the social system is benefited by this evolution. Once this evolution occurs, it will be systemically fulfilled the sustainable development agenda, which delays directly with language of complexity that comes up against strong resistance in the country. In order to the country contributes to the global whole in this sense, it is believed that sustainable practices are internalized by economic agents. This is what the research intends to address.

2 The little business complexity in Brazil and the failure of the global system: the lack of efficient management of the communication standard about sustainable economic development

There is little business complexity in Brazil because Brazilian companies are not able to understand the communication of meaning that is brought by the sustainable development agenda and one of the causes that justifies this little complexity stems from the fact that there is no commitment and management in the implementation of this sense within the structure of the economic system. Once this language was implanted, the economic system, through companies, would certainly be able to modify its structure and result in new operations with the positive externalities proposed by Agenda 2030. In addition, in order to comply with the ODS, development of products and processes capable of generating innovation. But it depends on the communication of such meaning that it affects cultural standard.

⁷ Autopoiesis is synonymous with self-referencing system.

The diagnosis derives from the observation that, in the case of Brazil, there is little engagement of the companies regarding the communication of meaning that exists in sustained economic development when the agents have a considerable share of participation in this processes. There is an operational vacuum between systems that does not promote reflection and communication about sustainable development. The companies, in their absolute majority, do not couple in their management structures and, therefore, of governance, the externalities presented by the sustainable development. They do not even have a governance structure.

Brazil's business profile is approximately 80% of micro-enterprises engaged in trade in goods and services. This means that Brazilian companies do not understand the organizational language that goes beyond the econometric function because they are not involved in planning, development and innovation (PD&I) and industrialization. (GALA, 2016)

On the other hand, since the economic strength of the country is centered on the monetary circulation promoted by the circulation of goods and services, it does not return, in due degree, to the production of new technologies, capable of developing the country with more autonomy and consequently, increasing internal development and contribute to global hypercomplexity geared to the information society (BRASIL, 2000), development and innovation.

Above all, there is little or no institutionalizing impact policy being developed to achieve an evolutionary framework of organizational responsibility that reaches the corporate degree of social responsibility, which in turn translates sustainable development (PELLIN; ENGELMANN, 2018). Above all, there is a communication gap between the institutions involved in sustainable development and the companies that should practice it or, at the very least, no commitment to change. There is, however, a loosening of the structures of political, economic, and legal system and greater permeability among them giving the systemic sense of disorder and institutional chaos.

With this observation the little evolution of the national system as a social whole is verified, because, for each system to fulfill its well defined role, it is necessary that there be a well-defined identity and operational closure that is not permeable to other systems, the result of which is, in fact, offer resistance to functional permeability (LUHMANN, 1990). This means that the legal system could not have its structure weakened by political and economic permeability in such a way that its operations were captured by ideals outside of the standards drawn by the generality and by the Federal Constitution. Also, this permeability that must be

avoided does not alter the selection process for input and output without which the system does not evolve. They are processes of evolution and not of capture of the systems. The operational closure represents health of the system and reinforces its identity and ability to offer irritations to others that results in the social whole.

Given this scenario, it is also possible to verify that these problems persist because they derive from a significant external failure of the western globalization implantation system itself because, if all the productive results take place in a network of communication of sense meaning of sustainable development, all are committed with the success or failure of it. And more. The circumscribed external fault lies in internal management failures. That is why developing countries lack a bit more commitment from developed countries, either because they are committed to speeding up internal processes, or because they have a host of global tasks that they cannot deliver.

Global policies must turn to the peculiarities of these countries, like Brazil. In this case, financial investments granted by the Agency, corporate missions given to Transnational and Multinational Companies to the internal environments of countries as standard have not resolved or significantly contributed to the systemic evolution of the same, quite the contrary.

The irritations brought in from outside to inside are identified as noises and, therefore, once disregarded by the internal system, the companies do not compromise, therefore, do not take responsibility for sustainability. This is a communicational management problem.

In Brazil, there are categories of microentrepreneurs, individual entrepreneur, micro and small business and large companies. The corporate category, therefore, conformed to the global hypercomplex environment and which understands the meaning of the communication language of sustainable economic development, involves a reduces number of companies.

It takes a significant operational effort from the Agencies and an inclusive communication project aimed directly at this massive niche of companies for systemic conformation. The internal institutions that maintain the communication link with national companies are the skillful tools for change because of the link of trust and organized association. These are the National Confederation of Commerce (CNC) and the National Confederation of Industry (CNI); the Micro And Small Business Support Service (SEBRAE). These institutions, among others, are at the center of communications of meanings among companies, sectoral policies and the practices of governance and development applied through new Technologies.

Therefore, a direct and focused commitment between the responsible agencies and the institutions can contribute to the hypothesis of an increase in internal complexities, which means an evolution in the degree of reflection, commitment and responsibility towards sustainable development that directly influences business decisions. Reflection is the change in scenario.

This is not just about economic development. It is a conceptual shock of governance and sharing of responsibilities, commitment and cooperation in the network so that Brazilian companies do not avoid the contribution, without there being an effective loss in the fulfillment of the Agenda 2030 because of the communicational failure of the Global system itself.

Western globalization as a social, economic, political, cultural and technological phenomenon marks a period in the history of humanity where there are no more territorial barriers in communication in all sectors of the organization in Society. This phenomenon planned the world territory and compressed the time simultaneously for all through the network connection (BRASIL, 2000). And, as a result, a hypercomplexity world of communicational interactions.

As a result of this universalization that is configured by the global language communication that conforms (LUHMANN, 1990), developing countries are called to give a contribution share in the reduction of external hypercomplexity, increasing the internal complexity. A paradox.

With this paradox one intends, internally, to increase the development; and, externally, equalize the systemic dimensions of globalization and improve the distribution of rights, obligations and responsibilities among all. The purpose of this is to plan, that is, to broaden the spectrum of this system followed by the same conformation, with sustainable economic development as the basis of other social, cultural and technological implications that will reach all without distinction.

However, this paradoxical partnership that has been increasing since the mid-1990s (BRASIL, 2000), shows signs of systemic failures that delay this process internally. These failures can be identified as contingent on the functioning of the system itself.

One of these failures can be observed in the communication processes between the global system and national systems, represented by the political inability of developing countries to operate part of the global communication standards in national territory, as far as the effectiveness of sustainable economic development is concerned.

One of the causes of the emergence of this contingent (LUHMANN, 1990) is the failure to construct to this paradox characterized by the absence of monitoring and progressive evaluation of internal communicative standards in co-ordination with external communication standards, in addition to discourse rhetoric. It is, therefore, a significant distance between constructed rhetoric and effective action (O'NEILL, 2005). Above all, in the case of Brazil, this contingent is aggravated by the fact that it is a late developing country that produces the permeability between the systems as a side effect when the sustainability and effectiveness of these processes depends on the capacity of differentiation between them. (LUHMANN, 1990)

As a result of this observation, Brazil has little complexity because, although it extends the banner of sustainable development and adopts some sparse measures, the social system has no cognitive expectation in this respect (LUHMANN, 1990) and, therefore, the economic system does not face this kind of irritation in its operations; in the external scenario, developed countries do not reserve attention to the balanced implementation of programs and, therefore, fail to achieve their sustainable objectives and reduce the hypercomplexity that circumscribes them. The virtuous cycle proposed by Agenda 2030 is not effective and the gear always presents technical failures.

In addition, it is possible to observe that this operational processes run into another problem: the internal system of developing countries does not, in its economic policy framework, couple mass communication – understood by cultural and social transformation – about sustainable development, private economic agents in this commitment.

There is no information monitoring and impact assessment (OCDE, 2018). For this reason, the loosening of the ideals of the global system is not uncommon, and its not uncommon for national states to undertake external commitments and fail to comply with them, giving priority to a national policy that is not always in conformity with the global one. (PEDRESCHI, 2017)

This scenario can be observed and exemplified from the analysis of a series of legal modifications of economic condition that were inserted in the country for the organization of the economic activity and that missed the opportunity to insert in these structural transformations of the system from changes in the legislation, the communication of sustainable development to increase internal complexity and reduce external hypercomplexity – a significant advance in the cultural pattern that is realized through the communication of meaning – as a unit of social reflection (LUHMANN, 2010) – and conforms the patterns of communicational language sustainable economic development for all.

This paradox is well demonstrated through the edition of the Complementary Laws⁸, 123/2006 followed by 128/2008, which took a significant mass people out of economic productive activities, without, however, changing the econometric communication pattern to the sustainable one, nevertheless, there is a constitutional provision in this sense associated with the Ordinary Legislation provisions, as in articles 966 and 1011 of the Civil Code of 2002, which contain normative expectations of an ethical and responsible for entrepreneurial activity, focused on sustainability.

It should be noted that these normative precepts of a legal -economic category were published as a response to the OECD intervention (OCDE, 2006), recorded in the Economic Surveys of 2006, at which point the LC 123 was published.

Thus, the legal institutionalization of these agents was done in two parts: the first, by LC 123/2006 (micro⁹ and small companies¹⁰) and the second by LC 128/2008 (informal individual entrepreneurs).

From the closer analysis of both Complementary Legislation that well portrays the failure of the internal system to implement the communication of sustainable economic development and the failure of OECD management to gauge the results of the suggested measure, there is, in fact, massive inclusion of informal and increased income from public coffers and, on the other hand, as a counterpart, the granting of the expectation of social security benefits and the tax incentive without any legal institutional promotion of these individuals to the condition of sustainable economic development. This means that legislation has missed the opportunity to change the communication pattern from econometric to sustainable. Hence the excessive permeability between the political, economic and legal system.

In a survey of 2011, published in the last edition of the National Atlas of Commerce and Services (MCDI, 2013), it was portrayed that most of the economic activities in the national territory originate from the circulation of goods and services characterized by trade, together, represent 88% of the existing companies, with 71.5% of the employees employed in these companies.

⁸ Both legislations deal with the massive inclusion of micro and small enterprises and the individual microentrepreneur in the social security system and in the collection of taxes.

⁹ It is the legal category of economic activity governed by LC 123/2006 that determines that the total annual gross revenue is less than or equal to R\$ 360.000,00.

¹⁰ It is the legal category of economic activity governed by LC 123/2006 that determines that the total annual gross revenue is greater than R \$ 360,000.00 and less than R \$ 3,600,000.00. LC 123/2006 was amended by LC 155/2016, which determines that, as of 01/01/2018, the total annual gross revenue will be up to R\$ 4.800.000,00.

By the same survey, 98% of Brazilian companies, ME and EPP, operate in commerce and employ 70.5% of personnel, along with large companies (more than 10 employees) that represent 2% in the commerce sector and employ 29.5% of staff. Therefore, it is the trade practiced by ME and EPP the economic movement of the country. Alongside trade are the services practiced by ME and EPP, which represent 99% of the respective market and employ 54.3% of staff; and large service companies that represent 1% of the market and employ 45.7% of the workforce. (MCDI, 2013)

On the other hand, but in the same sense, LC 128/2008, which inserted in the economic system, the figure of the Individual Microentrepreneur (MEI), characterized by informal practitioners of economic activity, excluded from the system, the numbers are repeated.

According to the Portal of the Entrepreneur of the Federal Government, the result in the first year of edition of LC 128/2008, to July 31, 2009, by the total number of enrolled in the country, there were regularization of 1256 economically active people, scattered in the States of Bahia, Minas Gerais, Federal District, Rio de Janeiro, Goiás and São Paulo. In the second year of edition of LC 128/2008, on 07/31/2010, by the total sum of all the units of the federation, there was regularization of the legal-economic situation of 408,099 economically active people (BRASIL, 2018). This represents approximately a 96.93% leap in federal government coffers in two years.

By the same survey that has been done for the last five years, the perspective is that the normative operation increased the financial volume of the federal public coffers, on average, at the rate of 11.27% per year, given the significant number of regularizations of these in all states of the country, which in June 2013 were 3.144.968 individuals; in June 2014, there were 4.160.417 individuals; in June 2015, there were 5.147.807 individuals; in June 2016, there were 6.196.314 individuals; and in June 2017, there were 7.210.745 individuals (BRASIL, 2018) included in the economic system and removed from informality in exchange for social security benefits and fiscal duty.

This represents in number of economically active people and under the systemic control of the Federal Revenue of 7.210.745 that is, 2.79% of the population of individuals out of a total 207.742.008 million Brazilians. (IBGE, 2017)

In this successful socio-economic inclusive scenario, but under the direct internal management failure over the OECD's decision to emancipate the country, the Brazilian government lost the opportunity, as the first bailiff (O'NEILL, 2005), to include this economically active mass in the standardized language of sustainable economic development,

whose desired consequence would be the increase of internal complexity and the reduction of global hypercomplexity, from the collection and analysis of the results of this inclusion or of this sustainability proposal.

Thus, in addition to the systemic permeability, that is, the structural systemic fragility, also the inability of the systems to respond positively to an internal cultural need for emancipation and empowerment of these citizens in order to include them in the people of sustainable development as actors processing.

3 The possibility of increasing business complexity in Brazil: the role of institutions in shaping and managing economic communication standards: towards sustainability

In view of this observation and confirmation, the increase in internal complexity results from the projection of the reach of the communicational standard that is intended to be implemented, which results in the change of the cultural pattern of the system and, therefore, of the communication of meaning and consequently of the language that the system uses to conform and identify itself as a unit that differentiates it from others, especially as a parameter for making operational decisions in the system (LUHMANN, 1990). In the case of the Brazilian economic system, its language of meaning communication is governed by the econometric probability and improbability of sustainability as demonstrated. This happens because the economic system closes in its autopoiesis – understood as the operational closure to maintain the identity of the own system in relation to the others – for any external noise that seeks to change the communication standard constructed and considered as cultural (LUHMANN, 1990, p. 29). Therefore, to present to the economic system, that another language of the type sustainable economic development is understood and established by econometrics; language of value and others interests, is not recognized because it represents externality to the system and, in view of the operational closure, this language is not selected and evolution does not happen for the maintenance of the system's self-reference. (LUHMANN, 1990)

So the first problem to be solved is how to open the system to make change likely, if that language is totally external to the system; second, once the system has been opened to receive this other language in its structure, which carries out new operations, based on this new cultural pattern of communications; and, positive externalities are achieved in consonance with interests other than those of the autonomous system itself, but by recognizing interdependence in relation to others (LUHMANN, 2010). From the perspective

of research, the legal system is one of them, provided that this system is not permeable, that is, captured.

In Brazil, both Complementary Legislation 123 and 128 maintained the econometric cultural pattern of the economic system and, therefore, the operational closure of business activities by the pattern of exploitation of the social system to economic reason by micro, small and individual entrepreneurs and this is posed as a problem, which results in the improbability of changing the cultural pattern of companies and entrepreneurs toward sustainability.

However, a more accurate look at the Economic System and its relationship of interdependence with the legal system, we see that there is a language of meaning about sustainable economic development in the structure of the economic system when, through the legal system, besides the two Legislations the Federal Constitution of 1988, the Ordinary Legislation of 2002 and the commitments assumed with Agenda 2030. All are embedded in the structure of the economic system and, therefore, the problem of structural opening is solved because there is no irritation with a new language of meaning completely foreign to the economic system; the language of sustainable economic development is known in its structure, but is not operated.

It is seen that the first, supreme and determinant in the conformation of the cultural pattern from the sustainability is given by provision of article 170, of the Constitution of the Republic; second, Ordinary, which determines all economic activity ethics and social responsibility, reaching the economic cultural standard for small and medium business alongside large companies, which can be seen from the reading of article 1011 of the Civil Code; and Agenda 2030, as the target of any domestic political, economic and legal operation, to demonstrate systemic interdependence. So the question remains: why does not the internal economic system operate from sustainable economic development if this language already makes up its structure? Certainly, because it does not suffer the necessary pressures from the external environment to the system itself for this and because the cultural pattern of communication about sustainable development has not been implemented throughout the Society. It's because? Absence of Project and network management of interaction, whose main role belongs to the institutions. The first institution involved in this lack of practical results regarding the ideals of sustainable development is the OECD itself, which appears as the first agent of justice (O'NEILL, 2005) alongside the State. There is a communication gap between the operation of the global system and the internal social system of the country exchanged by the agency. However, there is a truncated process of standardization in

communication within the network of interdependence interactions that make up the Global System, which according to O'Neill (2005) represent the desired result; the other systems, as second agents of institutionalization responsible for the practice, are the institutions of the internal system because "primary agents of justice may construct other agents or agencies with specific competences: they may assign powers to and build capacities in individual agents, or they may build institutions – agencies – with certain powers and capacities to act". (O'NEILL, 2005, p. 38)

For Luhmann (2005) it is said that there are decisions oriented towards making other organizational decisions within the system and, with this, it is possible to transfer and multiply the awareness of the decision that is mutually conditioned, in a network of interactions until reaching the everything that is intended. Thus, if the OECD does not review the management of the system for implementing sustainable ideals, all of it will be contaminated by rhetoric depleted of effective results or by capture, permeability between systems. Nevertheless, within the national system, as a second-tier judicial agent, there are institutions. These are the ones that, in practice, must coordinate the implementation actions of the commitments, conforming the internal system and increasing the internal complexity towards the development oriented by the western global system. However, as the relationship is one of interdependence between systems, the internal system can not be left to drift by the agencies. Joint co-management is required in the verification of the results gathered on changing cultural patterns towards sustainability, especially in sustainability-oriented economic development projects given the mismatches of the historical time that globalization and technology have flattened in the internal system, since the country does not have time to live its own time, *locus* where the internal natural processes are constructed. (PELLIN; ENGELMANN, 2016)

These phenomena, capable of provoking the necessary change, occur through communication derived from other systems, understood as irritations to the economic system, capable of generating communication within the economic system itself (LUHMANN, 1990). Communication capable of promoting sustainable economic development is capable of conforming the economic and social system, and therefore a negative response from other systems to force the opening of the economic system to such irritations. Institutions that intervene companies and Society play a fundamental role in this. For Luhmann (2005), this increase implies coordinated activities and constant management of processes and results without ever losing sight of the initial question about the desired development and the constant review of outstanding or insufficient organizational strategies

for the demands of development. As a result, it is possible to construct an increase in complexity and, at the same time, it becomes possible to manipulate the communicational cultural patterns that are to be achieved towards Agenda 2030. The national institutions compose this processes of coordination and planning of the communication of meaning that one wants to sediment in the orientations of business decision politics based on control assumptions previously given by the global system. These two classes of actions, coordination and planning; distribution and decision-making, in this systemic interdependence network is dynamic and must remain with autonomous decision-making, but guided by sustainable economic development (LUHMANN, 2005) for the purposes for which it is intended.

Part of the institutions, whether public or private, are indicator of the strengthening of the economic and social system, precisely because it acts as an intermediary of interests and conforms to behavior patterns and forming units of reflection for the decision-making exercise, including ethical standards, levels of corruption and government efficiency and transparency. Since 1979, the institutions have been collecting and analyzing data on the development and global competitiveness, whose discovery in this time span is that there is a direct relationship between competitive countries and strong institutions. That is to say, institutions that are able to manage – control and conform – behavioral patterns of the social system as a whole, involving the sectors, public and Society, in a common sense understood by all involved (DRZENIEK-HANOUSZ, 2015), from the sustainable economic development that requires a series of commitments and standard voluntary greetings.

In the case of Brazil, the institutions responsible for conformation of the Economic System to corporate standards of sustainability and development can be mentioned as being the National Confederation of Commerce (CNC) and the National Confederation of Industry (CNI); the Micro And Small Business Support Servisse (SEBRAE), among others, which have the power to exchange interests and conform the communication standards, changing the economic culture, but provided that the process is actively and properly managed and the information be given.

In order to demonstrate what is being considered as a systemic failure in the management of the communication standards on the sustainable economic development that is intended to be implemented with agenda 2030, CNI developed the Industrial Development Map (CNI, 2013) as an agenda for the period 2013-2022. There are four key groups for the country to gain in competitiveness. They are: at the bottom, education. According to the report, education is essential in building business-friendly institutions and environments and is a key element in stimulating innovation. It happens that this flag of education is not that of

sustainability. This is professionalization for the job market. Next, the macroeconomic environment: the efficiency of the Government, legal security and the development of markets as elements connected to the performance of industry. The third group includes production costs and investments that influence supply conditions, taxation results, financing, labor relations and infrastructure; and, finally, the fourth group, as one that has innovation as a key factor of productivity linked to entrepreneurial skills. It should be noted that if the OECD was already coordinating the management of these goals and including implementation projects for sustainable development it would fulfill the expectation of strengthening the competitiveness sector because it would be inserting national companies in this communication pattern and the inclusion of positive externalities of sustainable development in the econometric agenda. But the CNI does not demonstrate the necessary vision to emancipate the companies to the organizational condition and therefore, lacks information and involvement with this global perspective.

According to Barbieri (2007), the economic activities emancipated to the category of organizations bring innovations that can be seen as economic, technical, organizational and cultural facts. This represents a significant apparatus for institutionalizing the operating environment of organizations from their Economic System.

However, they are also affected by the ebb of this environment due to interdependence. The success or failure of an organization in fulfilling its role is dependent not only on the innovative effort to respond to organizational inflows and outflows “which involves, in addition to the aforementioned elements¹¹, the characteristics of the industry, the macroeconomic situation of the country or region and public policies, notably science, technology and innovation”. (ST&I)”. (BARBIERI, 2007, p. 89)

For Barbieri, innovative organizations should pursue the expected results as also “desired social and environmental performance, not just Market expansion, cost reduction and other such benefits” (2007, p. 99). It is an evolution that emancipates the reflexive unity of the system in relations to the others, because it establishes the interdependence that is taken into account in the decision making.

Companies with publicly traded capital in the São Paulo Mercantile and Futures Exchange (BM&FBOVESPA), recognized by the high degree of commitment to sustainable

¹¹ The elements mentioned for Barbieri are the economic, technical, organizational and cultural, because the Organizations "are based on the fact that innovations are macro-social processes, whose components (companies, teaching and research institutions, government agencies and NGOs etc.) can be better articulated to favor innovation processes" (2007, p. 89) (free translation)

economic development conferred by the Corporate Sustainability Index (ISE), are an example. But these companies are not the national majority, but a minority.

The ISE is nothing more than the public institutional recognition that even within the Economic system such companies were able to meet operate under the guidance of sustainable economic development. To do so, they improved their processes and innovated in products to match the millenium goals, so they became more competitive with space, in the most favorable investment scenario, inside and outside the country. In 2016, BM&FBOVESPA (2017) disclosed the 12th portfolio of companies conforming to ISE standards, which is valid from January 2, 2017, to January 5, 2018. This portfolio comprises 38 shares of 34 comanies and representes 15 sectors, totaling R\$ 1.31 trillion in Market value, equivalente to 52.14% of the total value of companies with shares traded on BM&FBOVESPA.

The ISE was created in 2005 in a technical partnership with the Getulio Vargas Foundation School of Management through GVces and occupies the 4th place in the initiative behind New York, London and Johannesburg. The index represents a benchmark of corporate sustainability and aims to serve as an inducer of good practices and reference in the field of socially responsible investments. For this reason, ISE reflects as an economic return for listed companies. The assessment is based on a questionnarie applied to companies that, voluntarily invited, respond and participate in the annual processes. There are seven evaluative dimensions: environmental, social, economic-financial, corporate governance, general, product nature and climate change. The evaluation of companies is done in two steps: quantitative (responses to the questionnaire) and qualitative (sending of supporting documents in a sample form). Since its inception, it has shown a yield jump in the stock market of 145.35% in relation to the 94.11% of the IBOVESPA (another index), based on a closing date of 11/22/2016. The index is calculated by BM&FBOVESPA in real time during the trading session, considering the prices of the last trades made in the spot market companies that hold the 200 most traded shares on the trading floor in terms of liquidity are invited to participate in the process.

The ISE counts as an investment option for those who care about the agenda. ISE's highest governance leve lis the ISE Deliberative Council, which is chaired by the BM&FBOVESPA and consists of 10 other entities: Association of Capital Markets Investment Analysts and Professionals – vice-chairman of the ISE Deliberative Council, Brazilian Association of Brazilian Institute of Corporate Governance, Ethos Institute of Business and Social Responsbaility, International Finance Corporation, Brazilian Institute of

Corporate Governance, Brazilian Institute of Corporate and social Responsibility, United Nations Environment Program and the Ministry of environment. The ISE edition for 2017 added to the index the public disclosure of the responses of the questionnaire answered by the 34 voluntary companies and also the inclusion of questions about the ODS for the global alignment by the companies. Therefore, the implications of business practices were analyzed with the objective of: 1) predicting indicators and targets in relation to ODS and its expected results; 2) provide resources compatible with its objectives and goals; 3) consider possibilities for cooperation to achieve goals and targets. Among the portfolio of the 2017 Portfolio (BM&FBOVESPA, 2017) is Natura, unique in the cosmeceutical sector; financial institutions (BB, Cielo, Bradesco, Santander, Itaú, Unibanco); energetical institutions (AES tietê, Cemig, Copel, CPFL, EDP, Eletrobrás, Eletropaulo, Engie, Light, Celesc); of retail (Lojas Americanas, Lojas Renner); the digital sector and electronic commerce (B2W); of road transport (Ecorodovias); of the food sector (BRF); of the parent company (ITAÚSA); building (MRV); of the insurance and social security sector (SUL AMERICA); of telephony (TELEFONICA, TIM); of the wood paneling industry (DURATEX); manufacture of aircraft (EMBRAER); of the pulp industry (KLABIN, Fibria); of medicine and health (FLEURY). All these activities and their respective companies make up the framework of ISE 2017-2018 as being the most solid to invest because they are responsible companies and committed to national and global systemic interdependence and therefore, cooperative with sustainable development towards the Order Constitutional and ODS.

According to BM&FBOVESPA (2017), the portfolio shows that: 100% of the companies formally and publicly adhere to widely legitimated voluntary commitments related to sustainable development (97% in 2015); 100% of companies published their sustainability report in the global reporting initiative model (100% in 2015); 100% of the companies have declared that they have formally and publicly adhered to commitments on climate change (100% in 2015); 95% of the companies have a board of directors that reports directly to senior management (first level) and is responsible for dealing with issues related to sustainability (92% in 2015); 97% of companies have processes and procedures implemented in relation to the application of socio-environmental criteria for the management of all their critical suppliers (89% in 2015); 50% of companies have one or more women on their boards of directors, as effective counselors (56% in 2015); 12% count on the participation of one or more blacks in the board of directors, as effective advisers (10% in 2015); 98% of companies said they had a policy of rich and 95% corporate risk management that considers socio-environmental aspects (92% in 2015); 98% consider the benchmark represented by Agenda

2030 and by the ODS in the management of business practices. Of these, 87% conducted analysis to identify whether there is a direct and relevant relationship between the business practices arising from their voluntary commitments and the ODS.

On the other hand, radiography also shows that the five ODS most frequently perceived as relevant by these companies are: 85% - ODS 8: promote sustainable, inclusive sustainable economic growth, full and productive employment and decent work for all; 83% - ODS 13: take urgent action to combat climate change and its impacts; 81% - ODS 5: achieve gender equality and empower all women and girls; 81% - ODS 12: ensure sustainable production and consumption patterns; 80% - ODS 4: ensure inclusive and equitable quality education, and promote lifelong learning opportunities for all.

It is noted that both the ISE and the ODS are directly in tune with the Constitutional Economic Order, as provided in articles 170 and 225. Likewise, the five ODS less frequently perceived as relevant by these companies are: 52% - ODS 6: ensure the availability and sustainable management of water and sanitation for all; 50% - ODS 10: reduce inequality within and between countries; 50% - ODS 1: end poverty in all its forms and everywhere; 33% - ODS 2: end hunger, achieve food security and improve nutrition and promote sustainable agriculture; 9% - ODS 14: conservation and sustainable use of oceans, seas and marine resources for sustainable development. When, therefore, companies consider factors others than those that are merely productive of profitable economic activity, they can qualify as sustainable organizations, therefore, responsible and integrated with the Constitutional Economic Order and designed for the results intended by Agenda 2030.

Therefore, if the mentioned internal institutions receive direct interference from Global System Agencies for a shared management of processes and results, as well as investments, it is possible that the communication standards for sustainable economic development are a brazilian reality for the contribution of the reduction of global hypercomplexity and the increase of the internal complexity, especially for the purposes of the development of which both the country needs to advance by all the companies in national territory and not only those that already meet the standards of Agenda 2030 because there is a very large range, still, outside the standards that stalls the global contribution and national development, beyond State management.

4 The new technologies as a determinant factor of the increase of the internal complexity: the case of nanotechnologies as promoters of the sustainable economic development

One of the results that can be obtained by modifying the econometric standard to the sustainability *ratio* in the economic operations practiced by the Companies is by the emancipation of these economic agents to the Organizational category; understood as an evolutionary stage of interdependence with the social and, above all, natural system. These are companies that, overcoming the condition of mere agents of the monetary circulation begin to exercise their share of institutional contribution, forming, in a network of interdependencies, new communication standards with the language of sustainability. A reflective unit for two systems, the economic and the social, imbricated by the fulfillment of Agenda 2030.

Once the companies are in the condition of organizations, small, medium or large; individual or societal, and consolidate communication, through the language of sustainable economic development, inserted in the development scenario and appear as propelling springs of PD&I and apt for growth and competitiveness; now under the impact of innovation on its internal processes and external operations. This is synonymous with progress from the economic and business perspective, especially because innovation causes organizations to improve the allocation of productive resources, in use, as yet untested. In a recent report titled Working with Brazil the OECD (2018) mentioned that innovation is the basis for new business, new jobs and productivity growth and therefore is an important driver of economic growth and development. Therefore, it points out that it has been working with Brazil for some time, offering evidence-based policy advice on the contribution of TC&I to the country's well-being and economic growth, which is synonymous with sustainability (PELLIN, 2019).

The OECD works with Brazil in a number of áreas to offer advice and Exchange experiences on the use of innovation in economic and social development. The inclusion of Brasil in the OECD's overview for Science, Technology and Industry 2016, has enabled policymakers to have the latest policy trends in the TC&I area. Brazil, for example, has some well-known leading innovators, leading the way in some high-tech fields such as deepwater oil extraction. This performance, however, does not affect the entire economy, according to the OECD (OCDE, 2018, p. 48)

The case of nanotechnologies, as a kind of disruptive technologies, understood as being those skilled at modifying the cultural patterns of Society, has been the most desired

input factor by national companies in view of the results and costs that nanotechnologies confer on the productive process, the problem of risk exacerbated by the unknown universe of possible and undesirable side effects to social and natural ecosystems (PELLIN; ENGELMANN, 2018; 2016), especially in view of the late modern development without joint and simultaneous management (BECK, 2011). However, there are already communication standards for this and it comes from the global system and must be internalized, by the same management standards, in the internal system, whose institutions play a fundamental role in the dissemination of this communication about the sustainability of development involving nanotechnologies capable of increase internal complexity and reduce overall hypercomplexity.

More recently, the Brazilian Institute of Geography and Statistics (IBGE) published in 2016 the PINTEC report of 2014. The document has collected data showing that companies of goods and services have inserted nanotechnology into processes and products, stating in the document that “biotechnology and nanotechnology are increasingly asserting themselves as general technologies that, from time to time, come with the potential to spread and affect various sectors of the economy” (IBGE, 2016, p. 710). The report shows that 1.8% of innovative companies inserted nanotechnology in their activity representing 975 companies out of a total of 2583 interviewees, a fall of 13.8% compared to the previous period of 2011, of which 975 companies, 89.5% innovated with nanotechnologies; in turn, number higher than the previous period.

Regarding the way, nanotechnologies use innovative companies, the report showed that it identified four categories: end user (60.6%); integrating user (25.7%); producer of inputs or nanotechnological products or processes (15.3%); planning and development, inputs or nanotechnological processes (18.3%). The appropriation of nanotechnologies was concentrated in the industrial sector for its productive use, confirming the trend already presented in the 2011 survey and confirmed in 2014, with a significant increase (IBGE, 2016, p. 75). This document emphasized that the Market is very promising and many companies have an economic interest in inserting nanotechnology into their profitable activity because of the savings in production costs; in 2014, investment reached US\$ 2,6 trillion or 15% of the global production of manufactured goods (FOLHA DE SÃO PAULO, 2015).

Nanoscience and nanotechnology¹² has been an object of interest in industrial and academic sectors because of the benefits of the global technological race and economic

¹² Technological applications of knowledge produced by Nanoscience, which represents the studies of nanomaterials, which are produced at the nanoscale and / or those containing nano-objects. To be considered

emancipation that strengthens the bonds of globalization and competitive sovereignty. The case of Brazilian companies that use nanotechnologies as an economic and productive factor, have been shown as an aggregating source of all the elements that should contribute to the construction of this scenario of increase of complexity through knowledge and innovation and, above all, in the search for sustainable development, precisely because the nanotechnology Market has a global communicational standard of compliance. In Brazil, legislation n. 13.243/2016, dealing with the stimulus to the development by the innovation: is based on the union of efforts and investments between companies, universities and government. However, it has once again left aside the implementation of communication standards that shape sustainable economic development in the framework of legislation and have the sustainable standard outlined in article 170 which, in turn, has the same global standard.

Therefore, the culture of responsible innovation is for nanotechnologies, just as nanotechnologies are for development. This means avoiding the risks of all nanotechnological development to social and natural ecosystems without hampering the drive of development through knowledge and innovation. To this finality, the global system has also set the tone for the patterns expected of transparency throughout the process, where social actors and innovation actors are mutually accountable for sharing development risks, which must be ethically, sustainably and socially in order to make the process of innovation and marketing of products desirable (SCHOMBERG, 2013, p. 51). It is not a matter of hiding or masking the risks, but rather of sharing them in making decisions about what to innovate and what risks do take. This depends, however, on how much the economic system is willing to operate the system by promoting positive externalities and how other autonomous and self-referenced systems have the interdependence to offer negative externalities and, in that clash, social and environmental gains according to sustainable development.

The expectation of the global system is that nanotechnological development has a meaningful language capable of orienting decision making the culture pattern of Responsible Research Innovation (RRI) and Ethical, legal and Social Implications (ELSI) for the conservation of interdependence between the systems involved in nanotechnological development and application. For this, the dimensions that should be taken into account in the

nanotechnology, a product must meet at least one of the two premises: 1. Contain nanoscale materials with controlled particle size, generally but not exclusively, below 100nm in one or more dimensions, and 2. Provide better products, which explore new properties, which differ from those of atoms, molecules and macroscopic materials. (GUTERRES, BECK & POHLMANN, 2012, p. 428)

responsible decision-making must contain in the economic factor of the decision: anticipation, inclusion, reflexivity and responsibility (NORDMAN, 2014, p. 87-98).

This means that the company must anticipate in the treatment of development risks and nanotechnology applications. Therefore choose and decide on what to innovate; must include all actors involved in democratization in the decision-making and decision that shares the risks voluntarily assumed by the process of information transparency; the reflexivity as a factor of most importance in the productive evaluation from the response of the user, consumer, supplier, investor, among others stakeholders, shareholders and nanoholders involved in each operation and, finally, that the productive activity is responsible, that is, light taking into account the aspects of interaction with other systems and how much risk can be managed from nanotechnologies.

Therefore, the challenges for companies and organizations are limited to the following standards: a) integration of the social sciences with the hard sciences as an essential factor for understanding and engaging issues concerning the social system; b) attributions of new meanings between the partnerships that are made during the production chain, which should benefit all, without distinction (VISEU, 2015). As an ethical, legal and social consequence – ELSI, companies and organizations should insert positive externalities in the exercise of citizen economic activity; citizen company, oriented not only for profit, but, above all, for the satisfaction of human needs; and from this new model of communication orientation as standard for decision making, to migrate from hierarchical decision-making processes to business management through co-responsibility; change the culture of the company or organization to responsible standards; reconfigured from the ethics set out in codes of conduct and social balance sheet for the transparency of all economic activity.

With this perspective of development that has been consolidating along with other economic activities, the country will, with correctness, increase the standards of internal business complexity, the result of which will be the significant contribution to the reduction of global hypercomplexity with regard to the discharge of conduits which aggravate the risk of development and consequently, the sustainable development pursued by agenda 2030.

It is seen that under the heading of sustainable development there is a global communication structure that is built in the internal systems on companies, institutions and nanotechnologies as conforming new patterns of complexities capable of reducing the hypercomplexity of the global system, whose result is intended with the Agenda 2030 is nothing more than a high degree of development that encompasses positive externalities to

people and the environment that must be sustained in the present generation and guarantee the existence of future ones.

In the case of Brazil, a country of late modernity and recent independence, the process is more arduous because democratic institutions are still being built and in the process of systemic differentiation, which represents a problem for the rapid consolidation of the reduction of hypercomplexity, since the internal processes have to deal with the permeabilities or reinforcement of identity still in formation.

Conclusion

The agenda 2030 has been the global target for all societies to achieve sustainable development. In order to achieve the goals set in the objectives of sustainable development, global hypercomplexity must be reduced by the increase of internal complexities in the countries. This means that the same policies must be implemented and the smooth, regular and efficient functioning of the processes must guarantee results.

However, in developing countries of late modernity, where democratic processes are still under construction, as well as internal systems are still seeking their differentiation, these processes suffer negative irritations that often resist the achievement of the goals and, consequently, little or no contribution to reducing hypercomplexity.

This systemic failure is taxable at the internal level, according to the survey done, by the few important business activity that involves planning, development and innovation; in addition to the scarce systemic culture about the understanding of the meaning of sustainable development capable of promoting the necessary change. Already, in the external scope, the distant management the little contribution, by the global agencies of implementation of the policies of economic development. It is seen that the emancipation of the country, is dependent on efficient communication processes and incentives to technological production, with special attention to nanotechnologies, and can be promoted by the institution involved in economic programs, responsible for coordinating the system.

Thus, for the problem of the country's limited contribution to reducing global hypercomplexity and how this can be overcome, there is initial confirmed hypothesis that sectoral institutions in the diffusion of meaning communication involving technological innovation and sustainable development can contribute to the dissemination of this meaning in such a way that positive externalities are known and recognized by the economic system

because they even translate into social gains; and for the global system, direct engagement in resource management and in the construction of such systemic communication can leverage the process by reducing the internal permeability and capture variables of systems that hinder the more democratic form of implementation of process in accordance with the claim that Constitutional and Ordinary legislation.

But the research is partial and needs to be studied in depth about the management measures adopted by the OECD, for example, in view of the system of implementation of the communication standards for understanding and adhering to the ideals of sustainable development in developing countries.

For the time being, it has been well demonstrated that in Brazil the economic system lacks understanding about the language of sustainable development capable of guiding business decision making towards compliance with Agenda 2030, whose responsibility can be attributed to the Institutions due to the inefficiency of this process the absence of efficient planning, development and innovation that prioritize, even, the development of nanotechnologies, which can contribute significantly to sustainable development, provided they produce positive externalities and social gains.

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