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**Brazil of the 21st Century: Strategizing with the Sociotechnical
Management Approach**

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Brazil of the 21st Century: Strategizing with the Sociotechnical Management Approach

ABSTRACT

This paper is an improved version from the previous publication Balloni (Balloni, Resende, and Targoswski, 2012). Reconsiderations and recontextualization aiming at the 21st Century are presented and, this new paper proposes HOW to Project Brazil as a relevant player in the complex interplay of world powers. The references from the previous 2012 paper were kept but updated and, the 18 news references utilized to construct this new paper are cited in the footnote of this paper. With an integrated territory and the world's largest economies, Brazil aims to be projected as a relevant player in the complex interplay of world powers; however, the thinking from public/private Brazilian managers is, presently, consolidated in visions of short & medium-term decisions makings. based on the "participatory model of sociotechnical management," we present a proposal on how the manager's political thinking may be unconstrained and able to formulate a long-term view for the future of the nation -i.e., by promoting innovation in the thinking from this public/private manager- and, reestablishing longer horizons of time, which are adequate for the future of Brazil. The "Participatory Model of Sociotechnical Management," works as the tool of change, the sharing of information, and the implementation of a shared vision of the future. These sharing's -information & vision- must be incorporated by all Brazilian Educational System levels and its Societal Decision-Making -Brazilians Citizens & Brazilians Business Partner-, as the fundamental strategic principles for a sustainable Brazil to the Brazilian citizens. The consolidation of the sociotechnical perspective can assist in the tremendous national challenges that may occur throughout the 21st Century.

Keywords: sociotechnical management model, long-term planning, political thinking, information sharing, the future and solidarity economy

Introduction & Literature Review

This paper is an improved version from the previous publication Balloni (Balloni, Resende, and Targowski, 2012). Reconsiderations and recontextualization aiming at the 21st Century are presented in this new publication based on the 2012 publication. The references from this previous paper were kept but updated and, eighteen news references utilized to construct this new paper are cited in this paper's footnote.

Like the other BRICS¹ countries, Brazil is still an emerging player in the complex contemporary world scenario. One of the world's most influential nations' common characteristics is being able to "make" the future. Decades ago, Brazil already presented evidence of having such characteristics of long-term goals, i.e., to construct the future, by promoting investment in sectors considered relevant, such as oil exploration, aerospace industry, steel, and iron industry, investment in renewable fuel research, etc. Also, recently - about a decade ago-, investments in sectors such as our naval industry, exploitation of oil in profound waters, nuclear, chemical, and biological, etc. However, this trend -to construct the future, long-term planning- has been gradually weakened due to SEVERAL REASONS including due to the turbulence of economic order. Since the BRIC group's creation, Brazilian economic performance has been weakened compared to the other countries in the bloc. Table 1 shows the variation of the BRICS member countries' national GDP in the period 2001-2019². The Brazilian GDP's weak growth requires a firm action, strategically conceived, to reverse its trajectory.

Table 1. Real GDP Growth (Annual Percent Change), 2001-2019²

Real GDP growth (Annual Percent Change)	2001-2004	2005-2008	2009-2012	2013-2016	2017-2019	Acc.	Average/Year
Year	%	%	%	%	%	%	%
Brazil	11.40	18.40	13.30	-3.40	3.70	43.40	2.28
China, People's Republic of	37.70	48.10	37.40	28.80	19.70	171.70	9.04
India	24.50	32.30	30.90	30.10	17.30	135.10	7.11
Russian Fed	24.30	28.30	5.50	0.80	5.60	64.50	3.39
South Africa	13.90	19.50	7.00	5.90	2.40	48.70	2.56
World	15.20	19.00	13.10	14.00	10.40	71.70	3.77

¹Note: Acronym created by Jim O'Neill in 2001, it represents Brazil, Russia, India and China, and after including South Africa, in 2011. This countries would form a new economic bloc, equivalente to USA or Europe economies.

²IMF Data Sets. Retrieved from: < <https://bit.ly/32w1qJC> >.Last access on 10/13/2020.

In part, the results can be explained when we notice political changes and economic shocks, especially the global crises that have occurred since 2009. Besides, global policy and national political decision-making certainly contribute to the results. In this respect, it is reasonable that political continuity in China and Russia, for example, has a positive effect on the implementation of long-term policies. The alternation of power influences the vision of the economy, for example, establishing different ways of dealing with foreign capital attraction and the increase/decrease of the State, exchange controls, and the decision on interest rates. World geopolitics presents complex decisions that depend on proactive decisions, such as joining economic blocs and entering into international cooperation agreements. These supranational negotiations depend, fundamentally, on trajectories established to take effect for the next 10 or 20 years - in short: future.

How can Brazil "reconquer" the tradition of conceiving and following the desired future to project other actions that may build a developed and sovereign nation?

The issue presented has several perspectives of analysis. One of them is the study of developing the present concept of the "future" in national politics. If we carefully examine it, we shall verify that, throughout times, there is a tendency of attainment of this future, to systematically, decreasing from an infinite horizon, eternal "come to be," as the slogan, "Brazil, a Country of the Future" (heard by almost all Brazilians, from various generations), *to the connection of minimal cycles of time* establishing chronological horizons of up to 12 months. This short-term horizon is incompatible with great long-term national projects and, this has been considered a type of "myopia" here called "unspeakable future."

The progressive loss of perspective of the future directly conflicts with several fields of thinking and knowledge exploration. Competencies such as projection, prospection, studies of these tendencies, and others intensive in intellectual activity are characteristics of the new times, age of emergence of the so-called Knowledge Society, where individuals have good judgment and choices.

How to make good choices without the perspective of a future result?

This way, the accomplishment of an effort is imperative for the redemption of the future view, putting an end to an age of doubts related to the slogan "Brazil, a Country of the Future" through promoting a debate under the perspective of a Participative Sociotechnical Management. Therefore, this work offers a proposal on two themes converging to such redemption: the harmonic conjunction from the ascent of the Brazil of the Future and the model of Participatory Sociotechnical Management, focusing on the 21st Century.

Description of the Proposal: Sociotechnical Management

According to Toffler (Toffler, 1980), an issue concerned with the scope of this work is the transition of Brazil from a "traditional" economy to a new form of economic organization, have been based on the following paradigms:

- agricultural activity (First Wave, period started at around 10,000 B.C.) and
- industrial activity (Second Wave, period started at around the 18th Century) for,
- subsequent advance in the direction of a knowledge economy (Third Wave -digital, connected, provided with a vast information repository, perhaps initiated in the 21st Century? -Third Wave, Toffler, 1980).

The intensification of the information flow, characteristic of the Third Wave, suggests that this also allows an intensification and refinement of the construction of a long-term view of the future within the Sociotechnical Management Model's approach.

Sharing such a view of the future constitutes a guideline for discussing actions with impacts over the next decades. Nowadays, all Brazilian government instruments utilized by the State Economic Policy and Management aim to short/medium-term goals with majoritarian targets quantified around projections for 12 months (i.e., GDP variation, the balance of the trade balance, inflation, unemployment, indexes related to social development...). In this paper, we propose means for reestablishing longer horizons of time, which are adequate for future discussion.

One of the possible alternatives of change would be the incorporation, at the political agenda, of an approach we call Sociotechnical Management, which conciliates chronological horizon connected to longer temporary cycles (quinquennial, or greater³) and, with aspirations and view of shared management between government and society (sociotechnical systems).

It is possible to construct a future view from discussions and debates, enabling acknowledging and consolidating individual views on the same desired future.

³“Long term” is understood as the greater time projection possible. The terms “short term” and “long term” shall not be taken as absolute reference, as their expression may vary: in Economy, there are fields of study with measures of time determined in days, months, years or decades; in Administration, there is similar phenomenon. The concepts of “long” and “short” terms here are connected to terms that have already been utilized in government Brazilian plans, with intrinsic distinctions: annual and inferior targets are associated to “short term”, quinquennial and superior plans are associated to “long term”.

Brazil: History, Economy and the "Loss of Future"

From the Genesis of the Nation to the Unspeakable Future

According to Furtado (Furtado, 2009), Brazil's economic development -as Portugal's colony-, starts timidly during the first decades after its discovery. The Portuguese and the Spanish performed sea expeditions, towards this "New World," with plentiful natural resources that could be extracted.

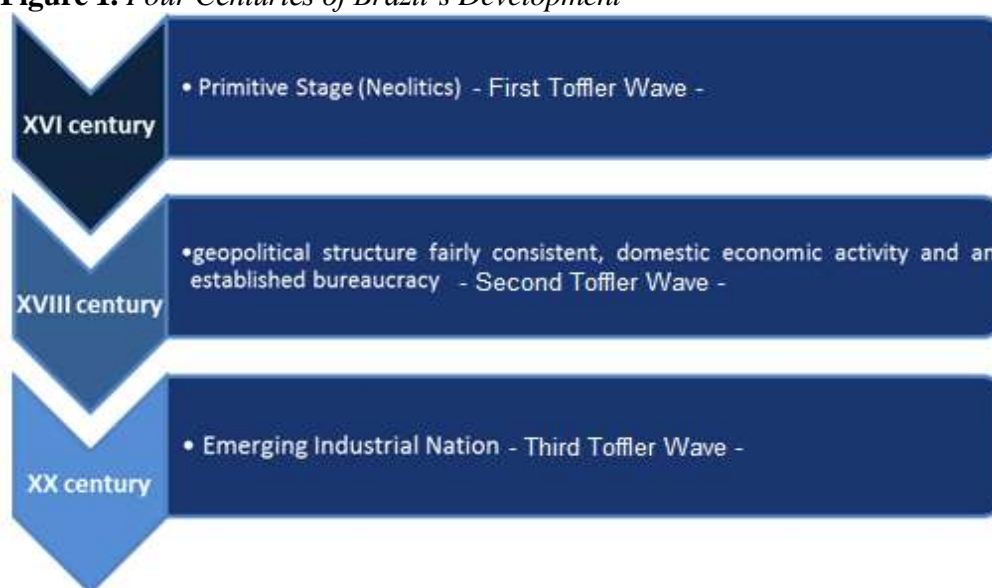
The emergence of "Brazil" occurred by the impracticability of maintaining the Portuguese territorial dominance of this New World. The maintenance of the Portuguese domains determined the need to make its lands in the American continent profitable. Perhaps due to the lack of options, the Portuguese invested, resolutely, in agricultural production, due to several factors present at the colony, such as tropical climate, interests of the colonizers, and conditions of the new economic order in development (Prado Junior, 2010). At that moment, the future was an infinite projection of land at a condition of "coming to be," i.e., the land exploration should be the result of planning that, according to Holanda (Holanda, 2010), did not occur methodically and rationally.

So, within this view, Brazil evolved from a primitive stage, analog to the Neolithic⁴ to a strategic domain: getting consistent geopolitical structure, internal economic activity, and bureaucracy. From colonized Brazil to the present (approximately 400 years after its discovery), Brazil, in the past 20th Century, became an emerging industrial power (Figure 1), with investments: a) - in a late industrialization (iron and steel industry, oil exploration, construction of roads) and, b) - afterward investing in more strategic sectors as aerospace research, engineering, and other actions aimed at the Nation's development.

This evolution of Brazil occurred by the action of the political forces that molded the country. In the second half of the 20th Century, the country's political forces made decisions resulting in the sacrifice of the future, paradoxically, in the name of the construction of a "country of the future." In the next section, these events will be described from the political point of view and the concerning sacrifice.

⁴The Neolithic comprises a progression of behavioral and cultural characteristics and changes, including the use of wild and domestic crops and of domesticated animals. The term Neolithic derives from the Greek νέος νέος, "new", and λίθος λίθος, "stone", literally meaning "New Stone Age". -Wikipedia, 2020-

Figure 1. Four Centuries of Brazil's Development



The intensification of the information flow, characteristic of the Third Wave (Toffler, 1980), suggests that this also allows an intensification and refinement of the construction of a future long-term view within the Sociotechnical Management Model's approach. Sharing such a view of the future constitutes a guideline for discussing actions with impacts over the next decades. Currently, all Brazilian government instruments utilized by the State Economic Policy and Management aim to short/medium-term goals.

Sacrifice & "Brazil, a Country of the Future"

In the second half of the 20th Century, a historical process takes place in Brazil: its consolidation as a developed nation and, unfortunately also, the emergence of the so-called "Brazil, a Country of the Future." This saying BLAST-emerged- in all Brazil: "I -Balloni-, had 10 to 12 years old and heard my father repeat frequently to me 'Brazil is a country of the future...'. My father has passed away last year at 99 years and 10 months and, I refuse to say the same to my sons and, I affirm to whom it may concern, Brazil must be our country, our future and have its future now".

Almeida (Almeida, 2005) identifies nine economic planning experiences executed by the Brazilian government from 1948 until 1985. Concerning this discussion, the most crucial plan is the Second National Development Plan (PND II: 1974-1979), which intended to replace imports and eventually promote exports: a long-term modification in the national productive matrix (Gonçalves, 1999). It was planned in a moment of global economic turbulence, such as the two oil crises and international credit restrictions.

PND II was a turning point in Brazil's national plans: all previous planning experiences, implemented between the 1940s and in the early 1970s, were aimed to "compensate" a late national development (Almeida, 2004). PND II was conceived under developmental thinking; the first Brazilian government intended to create an autonomous and developed Brazil's strategic basis.

Anyhow, despite all PND II virtues, the determined emancipatory strategy was not enough to promote development in the face of a recessive global scenario. The succeeding plan, the Third National Development Plan (PND III: 1979-1985), was jeopardized by the aggravation of national macroeconomic issues and by Brazil's inability to pay its enormous external indebtedness –resulting in currency devaluation, credit shortage, national accounts imbalance, and other results negative to the economy. PND III, thus, is also unsuccessful.

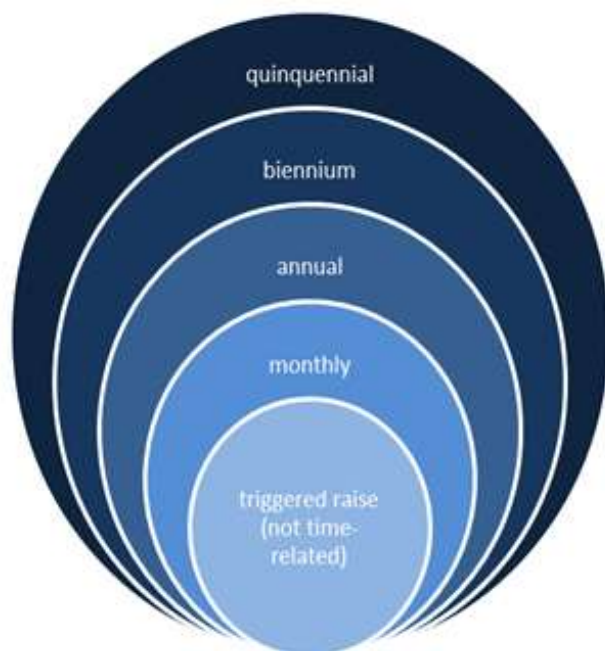
From 1986 to 1995, Brazil developed at least eight national economic plans (Almeida, 2005 and Leitão, 2011). For all the reasons we have demonstrated and the persistence of the economic problems, amongst them inflation, the government decreased the future's importance. It started to concentrate efforts on the short-term economic stabilization, such as the beginning of another cycle of macroeconomic financial stabilization called Multi-year Plan (PPAs), as stated in Brazil's Constitution (Brazil's Constitution, 1988), SECTION II/Budgets, Art 165, §1º: “The law that institutes the PPAs shall establish, on a regional basis, the directives, objectives, and targets of the federal public administration for capital expenditures and other expenses resulting therefrom and for those regarding continuing programs”.

From this historical retrospective, it is clear that until PND II (1974-1979) and, especially in this one, the Brazilian Project of a developed nation had been guided for a long-term view perspective. After PND II and III, the quinquennial planning was subdivided by plans intended to implement biannual reach instruments, after by annual targets. Due to the threat of hyperinflation, even the monthly period was considered too long. It was created the instruments "triggered raise: not time related" conditioning the variations of inflation independent of the chronological period: automatic salary readjustment, under the accumulated inflation in 60 days or 10 days! This gradual reduction of the reach of government planning is graphically represented in Figure 2.

In short: Figure 2 shows the gradual reduction of government planning -going from long-term -quinquennial- to monthly or less planning. Brazil was unable to continue the impulse -or momentum- of Economic and Social Development and falls into a macroeconomic crisis: non-growth in production and consumption, unemployment, price instability, uncontrolled inflation, and a negative trade balance. Nowadays -XXI Century- we are facing such similar instabilities.

After II & III NDP 1974/1990: the lost decade, the quinquennial planning was subdivided as showed in the figure, and, the interruption of these automatic wage increases started with the so-called Plano Real (1994), which was another cycle of microeconomic stabilization (distribution or allocation of resources).

Figure 2. *Decrescent Time Horizons in Brazilian Economy Planning (1960 until 1980)*



Due to the high volatility and instability, the country lost the perspective of projecting its future. The government policy now concentrates only on the present: a model of economic thinking, based on cycles and analysis within short term horizons, has been established and, the long-term capacity planning has been replaced by the possibility of controlling a series of targets connected to concise term horizons (Lessa & Earp, 1999).

However, despite the flaws in the PND, there is no evidence of population participation in the elaboration of these plans, but, yes, there was reactive participation of the population after its implementation and, here we have a political bottleneck: the need for the participation of Brazilian citizens and Brazilians business partners. This Brazilian participation is the essential for this paper: today - 21st century-, Brazil needs to create new investment cycles and conceptions of long-term strategies to construct its future through the participatory model of sociotechnical management. By removing the political bottleneck, we are creating a solid basis for our future long-term planning!

Brazil as a Globalized Country – and without Future

This hypertrophy of the short-term has had a significant contribution to an ideology of wild modernization, which gained notability at the beginning of the 1990s by the promotion of an initiative of reinventing the country in a more harmonized manner with the globalized world and, which has been characterized by the insertion of the organizations in a world context, by the large scale use of electronic processes, a rise of the services sector and the emergence of nations such as China, India, and Brazil to distinguished positions in the world picture (Balloni, 2006).

So, at the 21st Century threshold, Brazil starts to show up as a potential protagonist in the world without a long-term vision from the political-economic perspective. This Brazilian emergence has had a severe consequence on the context of the construction of the future! Despite the PPAs and the improvements regarding the image of "Brazil, a Country of the Future," we do not have a proper future projection (Mussalém, 2001). Nevertheless, according to Resende (Resende, 2011), we arrived at the second decade of the 21st Century only with targets, determined in a horizon connected to macroeconomic indicators -the PPAs-, and not to projections of an intended development. Solution for Brazil: The Participatory Sociotechnical Management Model as presented in this paper.

Sociotechnical Systems & Participatory Sociotechnical Management

Sociotechnical Systems

A sociotechnical system is composed of two sub-systems:

- a) The social system: living organization counts on the commitment of all its members as well as their knowledge, skills, attitudes, values, and needs;
- b) The technical system: an information system is composed of mechanisms, tools, and techniques necessary to transform inputs into products to improve the organization's economic performance. (Balloni and Bermejo 2010)

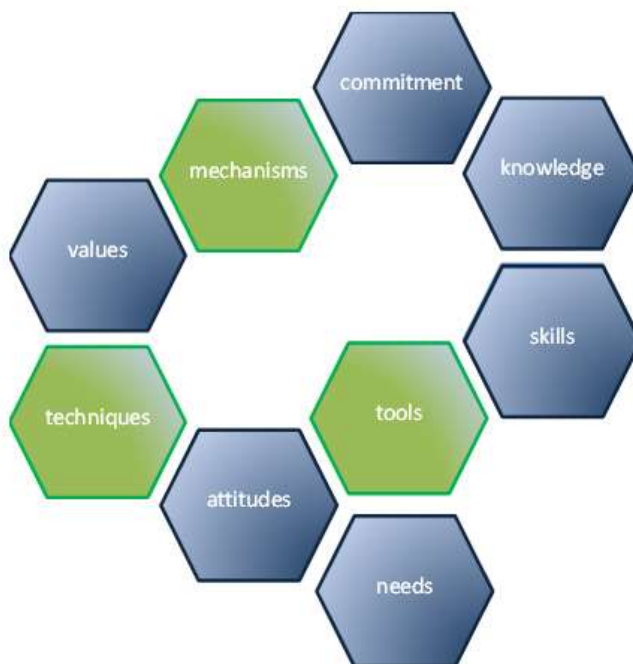
A sociotechnical approach assures the compatibility of the social and technical systems. Any organization can maximize its performance only when the interdependencies between these two systems are explicitly recognized and conceived: the social environment must fit the technical component and, vice versa, aiming for the sustainability of both systems. The Participative Model of Sociotechnical Management relies on these concepts: interrelationship among commitment, knowledge, skills, attitudes, values, needs, mechanisms, tools, and techniques.

These sub-systems' components may be seen as "structural blocks" that configure a system and determine its performance (Figure 3). In short: a sociotechnical approach assures the compatibility of the social -green hexagons- and technical systems -blue hexagons- in a participative approach. The fitting of the structural blocks (green and blue) explicitly recognizes the interdependency between its components. This is an essential characteristic of a Participative Model of Sociotechnical Management as proposed in this work. From the harmony between these blocks, the best condition for prosperity and maintenance is found. Prosperity is associated with performance, and maintenance is associated with projection or realization over time, and that is nothing else than the trend of forming a future perspective!

According to Balloni (Balloni, 2010), the present moment in history is characterized by developing a sense of unity and perception of a whole and;

hopefully, the rise of a sustainable and Solidarity Economy (SE). However, for the SE to occur, we need to learn new means of fomenting trust and social and environmental responsibility to develop a new conscience and new ethic –more inclusive and more participative. Nevertheless, for Balloni (Balloni & Targowski, 2010), in the information wave (see Figure 1), we find the ideal conditions for the ascension of the concept of a society where creation, distribution, diffusion, use, integration, and manipulation of information becomes a relevant economic, political and cultural activity. In this context, knowledge becomes the main creative force, a predominant component of human activity and, the more participative the sharing processes, the better shall be the expectations about the results obtained.

Figure 3. *Aspects of a Sociotechnical System*



The fitting of the structural blocks (hexagons) explicitly recognizes the interdependency between their components. This is an essential characteristic of a Participative Model of Sociotechnical Management as proposed in this work.

Brazilian Proposal of the "Participatory Model of Sociotechnical Management"

The consolidation of Brazil as a powerful and developed country must be stimulated and achieved, also, utilizing Research & Development and the creation of a collaborative ecosystem with a systemic view and engaged in the integration of interdependent themes such as ecology, biology, communication, organizations, economy, education, communities, technology, culture, and the human condition. This collaborative ecosystem is a gigantic Sociotechnical system, and, for such, the model of Sociotechnical Management applies.

After a decade of macroeconomic prudence initiated around mid-1990, the Nation is ready to start a cycle of investments, international growth, and the

conception of long-term strategies: the signs are clear and favorable to Brazil's development, to the condition of a "present future" (in other words, capable of forging its own desired future). However, the country's condition, favorable to the projection of a virtuous future, still lacks the redemption from the political and economic thinking towards long-term planning: absence of future and Brazil's future? We mean, even if Brazil today had the full condition to obtain recognition as a developed country, our model for the conception of the future, as established today, will not allow this new condition since the model of economic thinking has been -in the last years, based on short-term cycles. When observed from the sociotechnical perspective, this nonexistence of long-term planning brings out a pertinent questioning: is it possible for us to conceive a fair and participative society without choices and decision-making for the future planning being made? One possible answer is: it is necessary to consider expectations from the citizens, which may significantly impact decision-making and, consequently, in this planning being made!

This participation in the decision-making process must result in a shared future view: tonic of the participative model of Sociotechnical Management. Nevertheless, all nations are looking for new ways to gain a competitive advantage. For this competitive advantage to be sustainable, it is strategic to take into consideration the Brazilian Citizens (Figure 4).

In Figure 4, the yellow hexagon is the glue among blue (social) and green (technical) hexagons. The yellow hexagons are represented here by Public and Private managers as Business Partners from Brazil! In other words, the sociotechnical approach guides us to think about future planning as a collective co-responsible construction of the future and, internalizing in all the decision-making processes the issues such as commitment, knowledge, skills, attitudes, values, and needs of this society.

Figure 4, representing the Sociotechnical Management, can also be described as follows: The yellow hexagons represents the subjects, the blue hexagons are the adjectives from these subjects. The green hexagons are the technical tools available for the subjects. Therefore, the model of a participative approach of sociotechnical management has different configurations, enabling the organizations (state, society, country) to maximize their performance and, consequently, the look for the take-back of the view of the future.

Figure 4. *The Participatory Model of Sociotechnical Management System*



Brazilians Citizens -Public & Private Business Partners- are the glue for the best matching between the social and technical systems aiming at long-term planning (see Figure 3).

According to Balloni (Balloni, 2006), it is necessary to disseminate the concept of sociotechnical management among Brazilian citizens; and the access to information is fundamental and strategic, presenting itself as a critical resource under the optic of the competitive advantage and participative strategic planning. With globalization, all nations are looking for new ways to gain a competitive advantage.

Will these competitive advantages be sustainable?

As already answered, for this competitive advantage to be sustainable it is a must -strategic- to consider Brazilian Citizens (Figure 4): the yellow hexagons -as the glue for the blue (social) and green (technical) hexagons-, is represented here by the public and private managers, acting as Brazil's business partners: the relationship is the tonic of management, the assurance of extending a more significant period of the competitive advantage.

In short, to present a consistent and sustainable competitive advantage, it is strategic to consider the Brazilian citizens & Brazilians business partners and, the sociotechnical management approach -the hexagons blue, green and yellow, (Figure 4), guides us to think about the planning of the future as a collective, co-responsible way of building the future. Therefore, Figure 4 proposes a representation for the essential characteristic of the participatory model of sociotechnical management, a trending of forming a future perspective! Future perspective is what Brazil needs most, now!

Perspectives for Brazil: The Country of the Future & Future of Civilization

Perspectives for Brazil, the Country of the Future, Now

In today's world scenario, Brazil has the opportunity of becoming one of the most essential and respected players amongst nations inserted decisively into the globalized environment. To become a world player, Brazil must emancipate from its excessive monitoring of short-term indicators. Furthermore, it is necessary to make a "systemic innovation" on the political and economic thinking to make the political decision planning most participative and most aimed at the conception of an image of the Brazil of the Future: decisions making as an "Organizational or Nation Ecosystems", a Participatory Sociotechnical approach.

In this model of Sociotechnical Management, all the players would be capable of participating in the process of convergence of the views of the future and establishing a "strategic roadmap" from this convergence (harmony in diversity). The implementation of this Participative Model of Sociotechnical Management is dependent on the change of the public and private management political thinking: according to Balloni & Targowski (2010), it is a must to have the sharing of information and expectations.

The Participative Sociotechnical Management Model serves to make feasible, in a sustainable manner, this transition once it comprehends society's expectations and necessities (represented by their public and private administrators) and its interrelation Nation. This model represents an opportunity for political thinking to emancipate itself, becoming capable of formulating a Future View for the Nation.

Perspectives for Brazil in the Context of the Future of Civilization

According to Ruoff & Targowski (2010), to "a certain degree, Brazil is lucky to follow the developed nations' economic development paths as those nations in the Industrial Revolution in the 19th Century. Even though these countries have grown tremendously in terms of socioeconomic achievements, they pursue a strong deindustrialization strategy. As already mentioned, the developed economies are transforming from industrial to a service economy, which is weak and cannot provide sustainable employment. It led to the financial crisis in 2008 and the political-economic crisis in the United States in 2011.

Brazil is in a similar position to China after the fall of the Soviet Union (1991). To a certain degree, China did not follow Russia's chaotic and crony privatization and capitalism controlled by the political officials. Contrary, China introduced its solution; a firm hold on central policies and some business freedom at the bottom for average citizens. Brazil does not have to follow the Chinese model, of course. By the same token does not have to follow the Atlantic Civilization's self-deindustrialization for the sake of supporting global corporations at the cost of liquidating their middle class.

Furthermore, Brazil, a prosperous country in natural resources, must be aware that its inventories are shrinking. Instead of developing old traditional economies, either capitalistic or socialistic, Brazil should be the world leader in developing

ecoism⁵, i.e., a system that takes care of the ecosystem's interest. The successful production of biofuel in Brazil reflects this strategy and believes that Brazil can do it.

The current *global economy* has been driven by an acceleration towards the growth strategy, which is unsustainable since it leads to the population bomb ("more customers" is good for business), ecological bomb, and eventually to the depletion of strategic resources bomb. All these bombs connected create the *Death Triangle of Civilization Model* (Targowski, 2009). This model has confirmed the five major global concern trends:

1. Accelerating industrialization.
2. Rapid population growth.
3. Widespread malnutrition.
4. Depletion of nonrenewable resources.
5. Deteriorating environment.

It is common sense that the trends (2-rapid population growth) and (5-deteriorating environment) of global concern are truly defined (Ruoff & Targowski, 2010).

According to Targowski (2011), "today's civilization faces - the *gene* versus *mind* evolutions and *Globalization* versus *sustainability*. Hence, the following principles-strategies of the wise civilization should be applied. They are the most crucial for Brazil to pilot long-term planning and execution of national goals, objectives, and targets:

1. Hyper-eco democracy should generate progressive but wise ideas and governance.
2. Where among equals, the ecosystem is more equal.
3. Cognizing (education) acceleration to make decisions based on practical, theoretical, global, and universal knowledge and wisdom, securing *mind* evolution.
4. Ecoism – is a new world business system, which would provide the preference to the ecosystem, not to the capital (capitalism) or social prosperity (socialism), which are systems of too much waste of natural and human-made resources (super-consumerism). The ecoism should be based on deep economics, which calculates business effectiveness, taking into account the cost of natural resources in their full renewability.
5. Wise development of technology which should support but not conquer the society.
6. The nation-state concept should be sustained to prevent a diversity of the world society and secure the cultural heritage of nations and limit the aggressiveness of business, which will otherwise pursue a never-ending growth strategy, leading to the overpopulation depletion of the strategic resources.

⁵Ecoism: Pertaining to environmental or ecological. Source urban Dictionary.

7. The Knowledge-Wise Society, which should promote education, cognition, and knowledgeable and wise decision making in all spheres of looking for the sustainability of wise civilization, particularly preventing smaller populations.
8. The wise use of E-Global Village, which should support the mind evolution and vice versa is supported by the mind evolution to promote civilization's sustainability."

This set of key principles-strategies of civilization sustainability should lead to wise civilization (Targowski, 2011).

These principles-strategies, which we call the National Ecosystem, should be incorporated into all education and societal decision-making in Brazil. This task is enormous, but if not implemented, the current Brazilian civilization, as we know and enjoy, will vanish, even within the 21st Century.

National Ecosystem: How to Implement this National Ecosystem towards the Participatory Model of Sociotechnical Management

The concept of "Organizational or National Ecosystems" can be a beneficial management instrument for the sharing of information and the implementation of a shared vision of the future in a way that it allows the incorporation, by all level of the Brazilian educational system and its societal decision-making, the critical principles-strategies of a sustainable Brazil, to the Brazilian citizens. As a valuable ingredient to this paper, we present an adaptation of "five the characteristics of the Toyota Nervous System," also called by Osono as human www (Osomo et al., 2008). The new human www is called in this paper: "The Six Characteristics of the Participatory National Ecosystem for a Sociotechnical Management". These six -6- characteristics are composed by adapting the 5 Toyota Nervous System Plus the 8 Targowski Strategies within the scope of the Sociotechnical Management approach (Figure 4): the blue (social system) and green (technical system) hexagons which are kept together by the brazilian citizens & business partners (human system)-yellow hexagon.

The six characteristics of the participatory ecosystem towards a sociotechnical management are:

1. Open and lateral dissemination of know-how.
To facilitate teamwork; everyone is encouraged to share the know-how and expertise openly with others.
2. Freedom to voice contrary opinions.
The organization/nation should also be open to criticism and contradiction, aiming at the correct functioning of the model of a sociotechnical management.
3. Frequent face-to-face interaction.

Any manager to reach senior positions must acquire and embrace the skill of listening thoroughly and intently to what employees have to say and continually questioning and probing to find a better way.

4. To make tacit knowledge explicit: sociotechnical management.
Tacit knowledge is converted to explicit knowledge every time someone verbalizes or writes down their knowledge.
5. Formal and informal organizational support mechanisms.
Contribute to the effective functioning of the national ecosystem.
6. The eight key principles-strategies of a sustainable Brazil, should lead to developing a sustainable and wise nation ecosystem.

Finally, a closing issue correlating the six characteristics above and, the participatory model of sociotechnical management comes from solidarity ecosystem -the future perspective of the participatory model of sociotechnical management comes from solidarity ecosystem.

Solidarity Economy and the Need for its Ecosystem

According to Rais, 2017⁶, despite economic, financial advances, technical productive infrastructure, information, and communication technologies, we still live, in the world and Brazil in particular, with alarming levels of multidimensional poverty, increasing inequality, and income concentration by a large portion of the population that lacks essential services such as education, health, food, housing. A large portion of Brazil's population lives in permanent unemployment and self-employment or precarious jobs. The year 2015 presents 48 million people in formal employment in Brazil for an economically active population of 105 million people ((RAIS/2017⁶; IBGE/ 2015⁷). In other words, 57 million people have no formal job, and the majority live on self-employment as street vendors, waste pickers, application deliverers such as Rappi, Ifood, Uber drivers.

How to improve the population's living conditions allowing them to have access to a decent income due to their efforts?

To improve the population's living conditions allowing them to have access to a decent income, Brazilian President Lula has created the "Bolsa Familia", an income transfer cash program for family support. However, we must go beyond this innovative creation, through what we used to call the solidarity economy, which offers an exciting path for the population's empowerment through collective actions and cooperation.

The formation of the ecosystem for the solidarity economy is a fundamental tool for the emancipation and solidification of enterprises, contributing to the economic and social insertion of an immense mass of informal workers.

⁶RAIS. Relação Anual de Informações Sociais, Ministério do Trabalho, Brasil, 2017.

⁷IBGE, Pesquisa Nacional por Amostra de Domicílios, 2015.

Going beyond mentioned income transfer program, The "Bolsa Família," we propose the Solidarity Economy, which also offers an exciting path for this population's empowerment through collective actions and cooperation. According to Morais and Bacic, 2019⁸ "in recent years, the solidarity economic has presented itself as an innovative alternative for generating work and income and a response to social and labor inclusion. It comprises a diversity of economic and social practices, which carry out goods, provision of services, solidary finances, exchanges, fair trade, and solidary consumption. These practices are carried out by informal groups or and cooperatives and associations. They have strong weaknesses in developing their actions. Thus, to develop a solidarity economy, it is necessary to create an institutional system that promotes it. We can think of the concept of an entrepreneurial business ecosystem."

An entrepreneurial ecosystem is a community within a region of interdependent actors that interact with diverse roles, determining the ecosystem's performance and, eventually, the entire Economic of a region (Spilling, 1996)⁹. As a result of ecosystem performance, it is expected that, in addition to the results obtained by companies and other participant organizations (in terms of performance and learning), the interaction will lead to new enterprises' generation.

According to Serrano (2015)¹⁰, ecosystems are "networks of actors: Brazilians citizens and Brazilians business partners" (entrepreneurial people, researchers, financiers, politicians - executives, and legislatures, universities, etc.) that take into account the physical-territorial and cultural dimensions of the territory/country in question -in the present situation, Brazil. This territory is marked by a set of systems, such as:

- a) political systems (alliances and coalitions between social actors and political actors that constitute the basis for territorial governance);
- b) productions systems (which induce the creation of networks of actors involved in the production of goods and services) and
- c) territorial innovation systems (created by some groups of actors involved in the generation and diffusion of innovation). Such systems make up a "physical component" with sociological, political, and economic consequences.

Based on the entrepreneurial process and ecosystem concepts for business-based ventures, it is worth reflecting on the ecosystem for solidarity-based economy ventures, given the entrepreneur's characteristics in this segment. We can call it a Solidarity Ecosystem, which, in short, contributes to the participatory

⁸MORAIS, L.P.; BACIC, M. J. A importância do ecossistema empreendedor para a Economia Social e Solidária (ESS): avanços, retrocessos e desafios atuais no Brasil. Revista da ABET (Associação Brasileira de Estudos do Trabalho), v. 18, n. 1, p. 3-21, jan/jun. 2019. Available on line at <http://www.periodicos.ufpb.br/index.php/abet/article/view/38568> .

⁹SPILLING, O. (1996). "The Entrepreneurial system: on entrepreneurship in the context of a mega-event". Journal of Business Research, 36, p. 91-103

¹⁰SERRANO, S. Economía social y solidaria: una propuesta para un ecosistema más complejo. In: Información Estadística y Cartográfica de Andalucía. España, no. 5, p. 172-178., 2015.

model of sociotechnical management towards the economic and social insertion of an immense mass of informal workers.

Studies carried out by the European Community (2016)¹¹ and, for the South Korean case (Kim; Jung, 2016)¹² show examples of creating ecosystems developed to support solidarity economy actions.

From these studies, the Solidarity Ecosystem is understood as a coherent structure of the organization's solidarity-based entrepreneurial ecosystem process. It is composed of the following elements:

- a) Knowledge.
- b) Market access.
- c) Public and fiscal support for solidarity economy start-ups.
- d) Access to finance.
- e) Instruments to support networks and mutual support.
- f) Development of research and qualification in the area.

It is essential to include in this structure the ability to create indicators for the evaluation and monitoring of solidarity economy enterprises (Vuotto, 2017)¹³.

One of the ways to face such a challenge regarding the structuring of these components is to combine efforts and responsibilities of joint construction among the actors of the solidary economy, the university, and the government, through public policies (this, necessarily in the process of construction among the agents): the sociotechnical system (see Figure 4).

The formation of the ecosystem for solidarity economy is a fundamental tool for the emancipation and strengthening of its enterprises, given the structural weaknesses inherent to its modus operandi.

The collective (rather than individual) vitality of the ecosystem is a condition for its sustainability, maintenance, and evolution -the Sociotechnical System, (Figure 4). Rather than focusing only on the competencies, resources, and internal capacities, those involved should know the interdependencies between:

- A) ecosystem organisms and,
- B) emphasize social solidarity with the economy collective properties.

where:

A) According to Balloni¹⁴ ((Balloni, Azevedo and Silveira, 2012)¹⁴, “the people’s well-being is intimately linked to ecosystems' health because these systems depend

¹¹EUROPEAN COMMISSION. Social enterprises and their eco-systems: developments in Europe. Luxemburgo, 2016. Disponível em: < <https://bit.ly/2J5GO4m> >. Acesso em 08 outubro 2020.

¹²KIM, Y.; JUNG, T. Status of Social Economy Development in Seoul: a Case Study of Seoul. GSEF Social Economy Policy Guidebook - Seoul Metropolitan Government, 2016.

¹³VUOTTO, M. (2017). Content and scope of research on cooperatives: the performance of the Latin American Network of researchers on cooperatives. In: Review of International Co-operation. International Co-Operative Alliance, volume 104, p. 14-25.

¹⁴Balloni, Antonio & Azevedo, Adalberto & Silveira, Marco. (2012). Sociotechnical Management Model for Governance of an Ecosystem. International Journal of Managing Technology,

on them for various resources and services, such as wood, food, and water, and to regulate the climate. It is important to protect all components of an ecosystem due to the interdependence of all its elements. In a similar way to a natural ecosystem, an organizational ecosystem is a network of organizations and its environment which are in continuous transformation (a very know rule of nature, the Lavoisier's Law, states that: "In nature, nothing is gained, nothing is lost, everything is transformed." Thus, it can be said that the well-being organization is closely related to the health of the ecosystems in which those organizations are immersed. The health of the ecosystem depends on its components and strategies. There are ecosystems where predatory strategies rule (what is not suitable for ecosystem health in the long term). On the other side, ecosystems, where components adopt cooperative strategies, seem to be healthier in the long-term since its members are concerned with system stability rather than grab short-term benefits -the sociotechnical system (Figure 4). The management of an ecosystem happens via governance. Therefore, according to Balloni¹⁴, Governance is the tonic of management: it does not asphyxiate or disorders an ecosystem. Governance structures are created by ecosystems, depending on the environment's conditions and the relationships established inside the ecosystem. For instance, several firms (suppliers, retailers) can constitute an organizational ecosystem that works together to produce and sell a final good under one company's command. These structures must be designed to dynamically adapt to the organizational ecosystems' changes and their environment" (see Figure 4). Similarly, by the same token as paragraphs, we may state similar conclusions to a country ecosystem.

B) "Social and Solidarity Economy (SSE): According to Morais and Bacic, 2020¹⁵, SE is a concept that refers to enterprises and organizations, cooperatives, associations, foundations, and social enterprises, which specifically produce goods, services, and knowledge, while pursuing economic and social aims and fostering solidarity. In Brazil and many countries, SSE has been presented as an innovative alternative in generating work, income, and response in favor of social and labor inclusion. It can also be considered as a new, more humane, and inclusive developmental model. Furthermore, for Brazil, the sector of the SE is marked by specific weaknesses:

- b1) Microeconomic: market conditions (supply and demand for products and services), pricing and product costs, marketing conditions, access to technology, working capital for developments.
- b2) Macroeconomic: more general conditions for the functioning of the economy and the exclusion of certain groups of access to credit under facilitated conditions; high-interest rate; impacts of fiscal tightening on the continuity of programs, projects, and actions.

(IJMIT) Vol.4, No.3, August 2012. Retrieved from < <https://bit.ly/39dhJ2b> > or < <https://bit.ly/3nT0erZ> >. Lat access 10/13/2020.

¹⁵MORAIS, L.P.; BACIC, M. J. Social and Solidarity Economy and the need. for its entrepreneuring ecosystem: current challenges in Brazil CIRIEC-España Revista de economía pública social y cooperative, April 2020. DOI: 10.7203/CIRIEC-E.98.14138.

- b3) Supporting public policies: the lack of integrated and transversal actions (between ministries, secretariats, at the Federal, State, and municipal levels) that slow down potential advances towards the objectives generation of work, employment, and income and the existence of diverse experiences. This is also due to the lack of clarity about the definition and measurement of the "sector" (Morais and Bacic, 2020)¹⁵.”

Regarding public actions, the President Lula government created in 2002 the National Secretariat for Solidarity Economy (SENAES)¹⁶, which played an essential role in the development of the sector. SENAES was extinguished in 2017 under the President Temer government and transformed into an undersecretary.

In December 2019, the Senate Plenary approved the Project (137/2017) regarding constructing the National Policy for Solidarity Economics without clarifying how and where the funds for financing this policy would come. Also, this approval occurred in the year 2020, in the context of public policies against SSE in Brazil (Morais and Bacic, 2020)¹⁵.

It is expected that this scenario could change to increase sensitivity to the Solidarity Economics' importance in Brazil. It is necessary to understand it from a broader, transversal, emancipatory perspective and not as something relief -or assistance contribution- and philanthropic. It dialogues with the creation of work, employment, and income and, consequently, economic dynamism, but also includes at its core, aspects of local and community development, as well as greater political participation, making the participating actors' elements of the co-construction of their directions and facing their challenges (see Figure 4). It is a crucial element to build Brazil of the Future. The vitality of the sector and the fact that the actors organize themselves spontaneously allow predicting their survival and expansion when a new government understands its importance and starts promoting policies favorable to the sector.

Is it possible to think about a Future, even when we don't recognize it?

Yes!

The construction of a future - conceived, discussed, and shared - is crucial for institutional political terms that lead Brazil to a condition compatible with its potential.

The future does not need to be idealized as a formalized plan, but it can be "managed" through a participatory Sociotechnical system. There is an incredibly important element to this system, which is the recognition of divergent voices. In recent years, political polarization has created rivalries between political parties and hampered dialogue. Presumably, this is the most fragile element of today to strengthen a National Ecosystem (see Figure 4).

In reasonable terms, it is essential to highlight some challenges for The Brazil of the 21st Century -and perhaps for all countries, adapted to the different national realities:

¹⁶SENAES - Retrieved from < <https://bit.ly/3neIwz5> >. Last access in 10/13.2020.

- 1) The consolidation of supranational economic blocs: with doubts about the longevity of the group known as BRICS and the recent change in Brazilian foreign policy, with a robust political compromise with the United States, Brazil must reformulate its vision of global positioning. It is essential to mention that since 1991 the country has been part of MERCOSUR, with other countries in South America. The group still faces difficulties in consolidating its country member's priorities. In short, important decisions are made regarding establishing alliances, which can be based on agreements already established or on creating new blocs, for example, with countries in Africa and the East.
- 2) The decision on long-term economic policies: during the period 2001-2019, Brazil underwent a significant change in its economic policy, starting from neoliberalism, moving towards a developmental view, and returning, in the last national elections, to an orientation liberal. For the construction of a future, economic policies must be formulated to preserve the main economic indicators, regardless of adherence to certain thought lines. The preservation of this "hardcore" is a fundamental condition for attracting investments and implementing long-term economic policies.
- 3) A more developed and more participative society: Brazil has a continental territory and, on the social plane, a consistent problem of inequalities. The recognition of the voices representing the different segments of the population is the first step towards consolidating a society ready for a participatory Sociotechnical vision. The challenges include overcoming issues related to education - PISA INDEX, economic development & welfare - HDI index, and income distribution - GINI INDEX. These international indexes have shown the relative disadvantages of Brazil and, on the other hand, serve as a paradigm for the formulation of a national development strategy.
- 4) A country open to the world: after five centuries, Brazil is not yet ready to interact with the world. The constitution of a National Sociotechnical System will allow the creation of interfaces with other countries so that the "decision-making" about international cooperation can converge to a vision of globalized Brazil: the approximation of countries in the long term requires, for example, the widespread teaching of the respective languages. In this sense, there must be a national policy for teaching English, Mandarin Chinese, and other languages that are the basis for communication with international politicians, entrepreneurs, and researchers. Historically, Brazil has been notable in foreign policy, but this trajectory needs to "resonate" at the domestic level, with repercussions on education, politics, and even the National Financial System.
- 5) As the last challenge for Brazil of the 21st Century -and perhaps for all countries, adapted to the different national realities-, we propose in section 6 the creation of a solidarity ecosystem aiming to support the expansion of the solidarity economy as a way to contribute with the economic and social insertion of an immense mass of informal workers.

In Summary

Brazil urges the implementation of the participatory model of sociotechnical management as presented in this work. This implementation implies developing and promoting long-term innovation in the thinking planning of the Brazilian public and private managers, which, at present, is consolidated in the short and medium-term considerations.

One of the most significant challenges for the implementation, maintenance, and strengthening of this participatory model of sociotechnical management is the effective association of the social and solidarity economy with the six characteristics of the participatory nation ecosystem, resulting in an excellent tool for the proposal presented in this work i.e., the creation of means for reestablishing longer horizons of planning, which are adequate for future preparation through the participation of Brazilians Citizens and Brazilians Business Partners (see Figure 4).

So, the participatory model of sociotechnical management has as objective the search for the state of balance where radical contradictions coexist. For this reason, the existence of that which is denominated “comfort zone” is not allowed in a national ecosystem. The model of sociotechnical management aims at creating healthy tensions and instability. Such tension is a catalyst, as generates progress and provokes the attainment of results: strategic, efficient, and effective planning takes place only in such conditions, in other words, participatory model of a sociotechnical management, which has highlighted some challenges for Brazil - and possibly other countries - for the 21st century and, answering to the call from this paper “Brazil of the 21st century: strategizing with the sociotechnical management”.

By last -and not least-, a participatory approach needs the social and solidarity economy approach because the organizations that make up this sector of the economy are democratic and participatory.

Perspective

The following and final introspections are a must: will the world management from the XXI century, associated with the global partnerships, allow the Brazilian nation to compete more effectively in this XXI century, or will Brazil be undermined by greater global competition in their "home territory"? Indeed, is there such a thing as home-territory? It is essential to consider what Winston Churchill¹⁷ -: said: "We shape our buildings; after that, they shape us." Therefore, the Brazilian collaborative workspace and social environment of tomorrow are being shaped today! Are we allowed to work towards a common good? Who is willing to take responsibility for the space shaped? How can we define many of the ethical and social dimensions that arise with connectivity, information privacy & market share within an ecosystem of unfairly shared leadership, information

¹⁷Editorial – DEMENTIAL SAGE Jorunal/2008, by Stephen Judd Chief Executive, Hammond Care, Australia. Retrived from < <https://bit.ly/3fs578s> >. Last access 10/10/2020.

partnership, collaborative relationship, and unfair global management towards the common good? Actions in the global XXI century management may dictate Brazil's Future! i.e., is this global management ethical, effective, and generator of fair competitiveness towards a common good? In this XXI century, how can Brazil provide rationalization and control on its systemic management processes - or either, how may Brazil think globally and act locally towards a common global good? Is the world culture encouraging and rewarding two-way information sharing? This "two-way" is the systemic thought essence -to think globally and act locally¹⁸: perception of the inter-relations among the world nations instead of cause and effect of linear chains and, perception of the information changing processes between the nations in place of isolated instantaneous of these changes which reflect in the increase of global poverty.

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¹⁸The "Principle of Systemic Thinking -Think Globally and Act Locally-", has been coined and published by Balloni (Balloni, 2006).

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