BIOME-NETWORKS: INFORMATION AND COMMUNICATION FOR SOCIOPOLITICAL ACTION IN ECO-REGIONS

SONIA AGUIAR[1]
IARGO DE SOUZA SANTOS[2]
NAYARA ARÊDES[3]
SÓSTINA SILVA[4]

Introduction

Environmentalism in Brazil is inevitably associated with a type of actor which emerges in the preparatory context for UN Conference on Environment and Development, in 1992, in Rio de Janeiro: networks of social movements and organizations that use digital technologies to share knowledge, experiences and useful information for their tactical and strategic actions. Such a method of policy articulation in transterritorial networks, via remote communication systems, was first adopted by organizations and activists involved in the preparation of the Global Forum, civil society event parallel and alternative to official ECO-92 program, which correspondent in Rio+20 (2012) was the People's Summit.

The experiences and the processes that followed this event, in particular those related to the Agenda-21, led to the here called "biome-networks", i.e. environmental networks that are organized around the six Brazilian official biomes and find in eco--regional identity an important "symptom of tie" (Villasante, 1999). Three of them, the Amazon Working Group (GTA), the Cerrado Network and the Atlantic Forest NGO Network (RMA) were created early in 1992; later came the Brazilian Association of the Semiarid (ASA-Brazil), in 1999; the Pantanal Network, in 2002; and the Pampa Biome Network, in 2006 (see Figure 1).

This article presents a research summary about how biome-networks use information and communication resources anchored in digital technologies, both for coordination between its nodes and for their strategic collective action. It is just a cropping from a more comprehensive research entitled Geographies of Environmental Communication in Brazil[i], converging studies on collective actions networking, environmental commu-

1. Communication and Information Science PhD., with postdoctoral research in Geography, a professor in the Graduate Program in Social Communication at the Federal University of Sergipe (UFS), creator and researcher of the Environmental Communication Interdisciplinary Laboratory (LICA) and coordinator of Geographies of Regional Communications research group; email: saguiar.ufs@uol.com.br
2. Bachelor of Journalism, scholarship of scientific initiation at the time of the survey; email: iargocorreia@gmail.com.
3. Bachelor of Journalism, scholarship of scientific initiation at the time of the survey; email: nayara.aredes.jor@gmail.com
4. Bachelor of Journalism, scholarship of scientific initiation at the time of the survey - email: sostina@live.com.

nication and geographical approach. For this, some previous work on social networks (Aguiar, 2007a-b) is articulated with readings that allowed us to understand the ethos of certain environmental networks action in strategically defined geographical areas. The spatiality that characterizes (and justify) the organization of biome-networks correspond to the notions of "regional snippet" and "regional arrangements", discussed by Bezzi (2004) and by Haesbaert (2010), respectively.

Figure 1 - Brazilian "biomes-network"

Source: Authors' creation based on IBGE map and information from the studied networks (2012)

For better understanding territories in which these networks operate, we have sought conceptual contribution in Capobianco (2004), which places the "phytoecological regions" in the complex set of Brazilian ecosystems, and in Leite (2007), which describes

each biome both from an ecological point of view as a socio-cultural and economic one, including major predatory activities. Understanding the physical and cultural nature of the biome, as well as its historical and current situation, it is critical to evaluate what kind of problems the biome-networks deal with in these spaces, and what kind of strategies they adopt, according to their specific demands.

In this sense, the empirical approach to biome-networks have been guided by the following methodological procedures: searching for content available on the web pages of each network, including document files and media products; analysis of this documentation from the point of view of communicative actions proposed by the network and their privileged themes; gathering network activity indicators in the Internet environment (blogs, social media and discussion groups); collecting media visibility indicators on the role of the network in relevant regional contexts (quoted in newspaper articles and electronic clippings). Complementarily, it was mined, via Internet search engines, information about each network and environmental causes identified with the biome in question.

Institutional documentation networks aimed to identify: a) the terms of engagement between the participating entities; b) the operational arrangements that aim at ensure the dynamic and "effectiveness" of the network and that point out the degree of the proposed decentralization and horizontality; c) the means and ways for disseminating information and ideas to mobilize activists, influence public opinion and pressure decision-makers on public policies and marketing strategies. The specific empirical evaluation of web pages has been taken into account criteria for upgrading, quality and variety of content as well as the presumed audience of the materials.

2. Profile of the Brazilian biome-networks

Climatic variations that occur in the large Brazilian territory led to the formation of a complex set of ecosystems, from which it were identified 12 different phytoecological regions and six eco-regions called biomes: Amazon (or Amazon Forest), Caatinga, Atlantic Forest, Cerrado, Pantanal and Pampa (or Southern Fields). Although there is no consensus among researchers on this categorization, these six geographic and ecosystem areas were made official by the Ministry of Environment in 1996, by virtue of accession to the Convention on Biological Diversity (Capobianco, 2004). Since then, the IBGE map of these biomes[ii] has been used as a reference for these great "continuous geographical units historically recognized and occupied by human populations, although they are composed of mosaics of various ecosystems", as noted by Leite (2007, p.14) .

In some cases, this classification is merged in other territorial divisions, such as the Legal Amazon, a geopolitical construction made official in 1966, which aggregates nine states for regional planning purposes, and the semiarid region, bounded region by Embrapa since 1991 as the space where occur different manifestations of the Caatinga biome. This distinction is important because such territorialities differentiate two of the "biome-networks" studied here (GTA and ASA), although symbiotically linked to the biomes to which they are associated.

2.1. *The Amazon and the GTA*

The Brazilian Amazon, which covers the six states of the north region plus the most of Mato Grosso, Tocantins and Maranhão states, is characterized by large expanses of typical high humidity environments forests (dense and open, with foliate trees during the year). Its just over 4 million square kilometers corresponds to 47.65% of the national territory and 80% of the Legal Amazon. According to Capobianco (2004, p.131), "the size of the Amazon Basin and its great environmental heterogeneity are determining factors for the existence of a significant biological diversity," which "is still quite unknown".

It is the Brazilian biome most preserved in its original coverage, although it is also that where occur more advances in rates of deforestation due to the expansion of the agricultural frontier and agribusiness. Its importance to the environmental stability of the planet is due to the fact that in the forest "are fixed over a hundred trillion tons of carbon," according to Capobianco (2004), who explains: "Its vegetation releases somewhere around seven trillion tons of water annually into the atmosphere via evapotranspiration, and its rivers account for about 20% of all the fresh water that is dumped in the oceans by existing rivers on the globe" (ibid, p.132).

It is not an accident, therefore, that the Amazon is mandatory in the public agenda and the subject of disputes in the great debates about "the future of the planet", which makes ambitious the strategic goal set by the Amazon Working Group (GTA – Grupo de Trabalho Amazônico): insert into sustainable regional development policies the traditional communities – "the true guardians of the forest" - which make up a large human and cultural diversity in the region's lowest population density in the country (and one of the lowest in the world), under four inhabitants per km^2.

Articulated in the context of ECO-92 by popular and technical bodies, the GTA Network is made up by "regional collectives" distributed by the nine states of the Legal Amazon, which mobilize around 600 entities (given stable since 2006), among NGOs, social movements, traditional communities, coastal communities, labor unions, and environmental, technical assistance, community communication and human rights organizations. The location of the twenty collectives does not obey a homogeneous territorial criterion, but the network strategic socio-spatial "perceptions", and can be referenced by state or middle region (Roraima, Marajó, Alto Solimões etc). Eleven of them make up the Executive Board of the Network, and representatives of five affiliated entities form the executive board. It is through these "collective nodes" that the network seeks to get capillarity in the internal decisions and legitimacy in public confrontations by adopting sustainability policies.

By the time this research were conducted (2011-2012), the GTA Network used to focuses its actions in seven thematic areas: sustainable family production; social and environmental diversity; monitoring environmental conflicts; community communication (broadcasting); education for sustainability; pan-amazon cooperation; gender and citizenship. It also disclosed a list of 120 partner organizations for these actions, in addition to 26 other government partners.

2.2. *The Caatinga and ASA*

Unique biome entirely contained in Brazilian territory, the Caatinga includes a typical Northeastern vegetation (with incidences even in the north of Southeast region), predominantly composed by xerophilous plants (trees and shrubs that lose their leaves during the dry season), beside cacti, bromeliads herbs and annual cycle herbs (Capobianco, 2004, p.149). These characteristics associated with low rainfall and stony ground, own the semiarid conditions, make that the Caatinga is considered a fragile biome, which does not mean "poor" as preaches common sense. Accordingly to Capobianco (p.150), "recent studies have shown the existence of several unique landscapes and, therefore, a great heterogeneity of biome" (with record of 380 endemic plant species).

The almost extinguished Lear's Macaw and Spix's Macaw symbolize both the wealth and the devastation of the biome, which has had almost 70% of its area amended, a total of 734,000 km^2, corresponding to 8.59% of the country (IBGE, 2002 cited by Capobianco, 2004, p.130). "A considerable part of what is now classified as scrub used to be Atlantic Forest areas that has been deeply impacted by predatory exploitation activities such as logging for use as fuel and replacement of plant cover by inadequate agricultural practices to regional soil and climatic conditions" (ibid, p.150). In addition, the region has one of the highest population growth rates in the country (over 30 million) and "is the most populated of the dry climates of the world".

It is no coincidence that the launch of the Brazilian Semiarid Articulation (ASA--Brasil) took place during the third session of the Conference of the Parties of the United Nations Convention to Combat Desertification (COP 3), held in Recife in 1999. On the occasion, it was presented the Semiarid Declaration[iii], a document that summarizes the network insights into the semi-arid region and its proposals for the Caatinga biome. Associated with the statement, proponents of network formulated, in February 2000, a basics charter to be signed by all entities intended to come to join the network.

In June 2012, the ASA website informed the membership of 750 organizations, including NGOs, associations, trade unions and federations of rural and urban workers, community associations, social movements, public and private international cooperation agencies, and religious organizations. To ensure the horizontality of the decision-making process, the member entities were organized in state forums or local ASAs and Working Groups (WG), which subsidize their Executive coordination (composed of two members from each state in the region).

In the charter, the ASA is defined as "regional political articulation space of organized civil society", which "is based on commitment to the needs, capabilities and interests of local people, especially family farmers." Those who subscribe this charter are committed to "sensitize civil society, opinion leaders and policy makers for a coordinated action in favor of sustainable development", aiming to "contribute to the development of structuring policies for the development of semiarid." From a pragmatic point of view, the ultimate goal of the network is to guide the coexistence with the semiarid region, with drought and low rainfall, strengthening family farming in ways to be compatible with the environmental conditions of the region.

2.3. *The Atlantic Forest and the RMA*

The Atlantic Forest is the second largest forest in South America, which originally stretched for 17 states, over almost the entire Brazilian coast (from Rio Grande do Sul to Piauí), in addition to lands in Goiás, Minas Gerais and Mato Grosso states. Its native vegetation used to cover about 15% of Brazilian territory (1,306,000 km2), of which there are currently only 7% to 8% - about 100,000 km^2. Still, it is considered one of the richest sets of ecosystems on the planet, with about 20 thousand species of trees, with 8000 of them endemic. This also covers hundreds of endemic animal species, including mammals, birds and amphibians. However, of the more than 200 endangered species in the country, 171 are of the Atlantic Forest (cf. Capobianco, 2004, p.139-140).

Areas originally covered by the Atlantic Forest are the most inhabited nowadays (about 60% or 100 million people in 2012), which explains in large part the process of devastation of forests. The main remnants of the biome "are concentrated in the states of South and Southeast regions, covering part of the mountain ranges named as Serra do Mar and Serra da Mantiqueira, where the settlement process has been hampered by rugged terrain and poor transport infrastructure" (Capobianco, 2004 p.141).

It was with this reality in mind that a group of entities that operate in this vast domain proposed the creation of the Atlantic Forest NGO Network (RMA – Rede da Mata Atlântica, in Portuguese)[iv], during the ECO-92 Global Forum. Its goal is to "join forces and exchange information" in order to provide solutions that, individually, local authorities would not be able to formulate. Over time, the Network brought together more than 300 affiliates (62 of them in São Paulo), from fishermen's associations to international groups such as Greenpeace. All they endorsed a statute of 23 pages, formalizing its relations of mutual interest.

One of the key pieces for the performance of the RMA is the thematic groups (GTs), who discuss and formulate "analysis and proposals for action by the authorities in order to put into practice the Strategic Plan of the RMA." Composed of 40-50 members of affiliated organizations, the GTs assume "the task of articulating monitoring and mobilization actions, proposals, conduct campaigns." The variety of themes that GTs have to deal with presupposes qualified personnel both in content (expertise) and in the management and dissemination of information accumulated. In this regard, collaborative work between different civil society organizations has been crucial in qualified dialogues with the instances of power - parliamentarians, governments, business community and multilateral organizations.

To facilitate the monitoring of policies for this biome and participating in discussions with the Ministry of Environment, the World Bank, the National Congress and other decision-makers, the RMA moved its headquarters from São Paulo to Brasilia in 1999, and hired a staff to form an executive secretariat, which would support the resolutions of general meetings and implementations assigned to the National Coordination. Ten years later, however, the office closure was announced curtly by the Network website, which after remaining "frozen" for some years, was taken down by loss of domain control.

2.4. *Cerrado and the network that bears his name*

Covering about 23% of the Brazilian territory and spread across nine states, the Cerrado is the second largest biome in South America and considered the richest savanna in the world. The presence of transition zones with almost all other national biomes gives this conglomeration of ecosystems a strong endemicity (about 4,400 plant species) and biodiversity. Cerrado also serves as a cradle for rivers feeding bowls from all over the South American continent, which is of fundamental importance for the maintenance of other Brazilian biomes.

Recent insights into the Cerrado contradict the widely held notion that central region of the country consisted of barren lands, based on their tree trunks and twisted branches and thick shells. Currently, Cerrado is called "Barn of Brazil" as a result of agricultural, road and demographic expansions started in the 1960s and deepened between 1970 and 80. But it is not recognized as a National Patrimony by the Federal Constitution, which makes relegated it to secondary biome condition, devoid of an adequate monitoring system and attention to traditional communities.

It is noteworthy that such communities develop strong exchange relations with the environment, creating its own identity. Studies cited by Capobianco (2004, p.145) point out a significant percentage of local and native plants used by the population, both for medicinal purposes as eatable, especially fruits, which "stand out for their variety of shapes, colors, flavors and aromas", which have been used in sweets and beverages. Also according to this author (p.146), based on data from Ibama[v], deforestation, fires and the use of chemical fertilizers and pesticides have already left 67% of the Cerrado areas "highly modified" with gullies (a type of erosion), silting and contamination of ecosystems. It is estimated that only about 20% of the original area of the biome are still preserved.

To try to curb this predatory process, several organizations signed the Treaty on Cerrados, the network source, during the Global Forum, in 1992. The document warns the lack of priority to the biome in the context of public policies and the environmental and social damage brought by the rapid process of agricultural occupation and expansion of the agricultural frontier in the region (facilitated by government and multilateral incentives for decades). In addition, it points out actions capable to reverse the ongoing environmental destruction framework and advocates the biome recognition as a national heritage. The text takes the interests of local communities, with their symbols and cultural values, and encourages population participation in governmental decisions, based on transparency and the defense of "sustainable development".

The Cerrado Network presents itself as an articulator of 300 entities, even though it lists only 83 affiliates, which operate in nine Brazilian states and have diverse profiles, from traditional NGOs such as Ecology and Action (ECOA) - with international recognition - to local associations as Warã, representative of A'uwe-Xavante tribe of Mato Grosso. The joints between them are made by a Facilitation Committee, which is the instance of implementation and network representation, and a Board made up of 21 organizations representing the Network in their regions. It is up to those bodies "perform, along with

coordination, planning, monitoring and evaluation of actions of the Cerrado Network, becoming thus a highly political and strategic forum"[vi].

2.5. *Pantanal and the network around it*

One of the largest sedimentary plains in the world, the Pantanal is characterized by well marked alternation of two seasons: drought and receding (April-September) and the wet or swampy (October-March), which cause profound changes in the landscape in each period. Covered by a lot of rivers belonging to the hydrographic basin Parana--Paraguay, the plain occupies about 110,000 km^2 in the states of Mato Grosso and Mato Grosso do Sul and spans of Argentina, Bolivia and Paraguay lands. "Almost the entire Brazilian fauna is represented in the Pantanal", from large mammals to small invertebrates, including more than 650 species of birds.

However, the good conditions of preservation of the biome have been endangered since the 1980s, for "serious impacts to natural ecosystems": "Large agricultural projects of soybeans and sugarcane have been implanted, using chemical fertilizers and pesticides in large quantities. There was also the expansion of mineral exploration activity for gold and diamond, beside increased livestock concentration, without any care or environmental control" (Capobianco, 2004, pp.147-148). Three other stress factors and threats to the biome are: the fact that 95% of Pantanal lands are located on private property, many of which are intended to ecotourism; the insistent project for construction of the Parana-Paraguay Waterway by a consortium of five countries; and greed on the Guarani Aquifer, the main underground reserves of fresh water in South America and one of the largest aquifer systems in the world.

The organizing idea of the Pantanal Network arose in the context of Rio+10, in order to search for alternative sustainable development to preserve the natural, human and cultural rights and ensure the maintenance of quality of life in the Pantanal region - recognized as a Biosphere Reserve and Natural Heritage. For this it has the participation of over 50 institutions, including representatives of Paraguay and Bolivia, with varied profile: neighborhood associations, traditional communities, social movements, scientific community and international organizations such as the WWF - World Wild Fund.

It is up to the Network Coordination (composed by members from the three countries) ensure the fulfillment of its objectives: support and suggestions of regional public policies based on scientific and traditional knowledge; search for alternative and viable green initiatives; encouraging the role of communities and inhibition to projects with potential social and environmental degradation. In this sense, the Pantanal Network has acted against the construction of dams and hydroelectric power plants in the Upper Paraguay Basin, triggering the government and civil society in promoting studies and campaigns.

2.6. *The Pampa biome and its network*

Occupying two thirds of Rio Grande do Sul, the region of "pampa" - indigenous word meaning "flat region" - lives the dilemma between being regarded as an autonomous

biome (as Leite 2007, based on the IBGE classification) or just part of the Southern Fields biome, as Capobianco (2004, pp.150-152) prefers. Considering that the description given by the second author is very short (unlike previous) and that the network in question is identified only with the context of the "campanha gaúcha"[vii], it was decided to take into account only the characteristics of the Pampa biome presented by Marcelo Leite[viii].

The Brazilian Pampa accounts for only a quarter of the South American biome that spans 700,000 km^2 of southern Brazil, Argentina and Uruguay lands. In Brazil, it switches covered planed surfaces undergrowth (grass) with some shrubs and rare trees and undulating terrain, smooth reveal that rarely exceed 200 meters (known as Campaign Plateau). Several sources disclose that only 1% of the biome remains protected while environmentalists point to livestock, farming rice and the expansion of soybean cultivation as the main threats to Pampa, not only by the exclusion of native grasslands as the impoverishment of the soil, introduction of forage species and imbalances in the water system.

The Network of Environmentalists Entities and Civil Society Organizations in Defense of Pampa Biome is the newest of the biome-networks. Created in 2006 in the city of Santana do Livramento, it managed the accession of 45 entities to its Charter of Principles, between NGOs and social movements, according to its blog. In the document, the Network "proposes to contribute to the creation of integrated public policies in Pampa Biome, strengthening policy interfaces, technical and organizational civil and state organizations working at the local level"; and "sensitize civil society, opinion leaders and the policy makers for a coordinated action in favor of sustainable development, giving visibility to the potential of the Pampa Biome." However, the network appears inactive since July 2007, as explained below.

3. Information and communication tactics

Julian Corbett (2006), which analyzes the communication tactics of environmental groups aimed at social change, notes that they compete for attention of multiple hearings on the same communication spectrum that other organizations, including the opponents. So, the "how" and "when" the tactics are used make all the difference. For the author, the communication between the members should be on the top of the group strategic priorities, in face of its multiplying and mobilizing potential. This "internal" communication is necessary to strengthen the "sense of belonging" and solidarity and the role of each individual to achieve the collective goals.

Corbett points to three factors that influence the quality of environmental reporting: the stage of the matter or subject in focus (emerging issues require preparation and awareness, ongoing problems require constant communicative actions); institutional group stage (if notable trajectory or beginner in the field); and the structure and internal competence for information and communication activities (research, publications, campaigns, petition, lobby etc).

The following analysis seeks to identify how Brazilian biome-networks lay hold of these information and communication tactics, both for coordination between its nodes

(internal communication) and for its strategic collective action (visibility of its causes, influence on public debate and in decision-making processes of its interest). The data collected allowed the observation that networks institutionally consolidated and branched out like GTA, ASA and the RMA, can maintain both a media visibility and a state of active interaction among its members (who are motivated to feed back the network with its own local communication). Others networks like Cerrado and Pantanal fail to maintain an ongoing public visibility, despite having built an informational legacy and a political legitimacy over time, experiencing periods of apparent stagnation.

It is reiterated here, however, that all network always has a visible face, seen from its public performance and the accounts of its participants, and an invisible face, resulting from internal and interpersonal communication among its members (mostly via email lists and newsgroups) and the multiplier potential of each node outside the network (Aguiar, 2007a). This tactic invisibility is similar to what Melucci (2001) called "latency state" of the network actors, who preserve their autonomy while maintaining the established links. Eventually, these actors emerge to the surface to some collective manifestation. After the period of action, however, the interaction becomes invisible again, returning to their everyday way. The mobilization for Rio+20 (2012) exemplifies one of those times of strategic visibility.

3.1. *News from GTA*

This is the oldest of the biome-networks and also the more engaged in the strategic role of information and communication for networking and mobilizing its collective nodes. It was the only one to participate in the launch of CRIS-Brazil Articulation (for Communication Rights in the Information Society), in 2004, and to issue a Public Communication Draft in the Amazon, based on inter-network action[ix]. It is also the only one to regularly include communication as one of its central themes of strategic action.

Until July 2007, the GTA website (www.gta.org.br) had a collection of documents about its operations and regularly published news commented clipping about the region, as well as reports submitted by its regional collectives. However, a fire occurred at its regional office in Brasilia, which coordinated the communication network, devastated his memory. The sections corresponding to this collection - Newsletters, Publications, Photos and Videos - remained without content until the conclusion of this article, and there were broken links to documents that would allow better understand the role of regional collectives.

Nevertheless, the dynamic update of viewable news from the site indicates that the network homepage has remained active, both in the production of own content as for maintaining the clipping in "Media News". Automatic search made with the name of the Group recovered other news that prove the participation and performance of the GTA members in events related to their areas of expertise such as seminars, forums and demonstrations repudiating the environmental policy of the federal government. These reports indicate that the GTA has regional media visibility, serving as a source of information for most news web portals and agencies that cover issues related to Amazon. Although community

radio is defended with emphasis on the strategic planning of the network, there was no information available on the website about programs produced by regional collective.

Another dynamic area of the site's home page is that which aggregates news sent via Twitter related to traditional populations of the Amazon, to the social and environmental dilemmas of the region and to a lesser extent, environmental issues of national interest. It is the more updated informational resource and bridges the gap between regional collectives and other members of the network. The GTA has a Facebook profile, used for public interaction and dissemination of information, particularly those related to mechanism for Reducing Emissions from Deforestation and Forest Degradation (REDD). It also has a channel on YouTube, with updated videos that bring depositions related to the thematic areas to which the GTA is dedicated, besides members and partner institutions of the network.

3.2. *Interactions of ASA*

The ASA's website (http://www.asabrasil.org.br) is frequently updated by a team of journalists who make up the press office, an activity-means that the coordination of the network has prioritized for over ten years. On the homepage there are calls with links to access materials about ASA published in the press (clipping), as well as news and events, videos, radio programs, advertising campaigns and social media sites. The site also features reading suggestions on the topics with which the network works (water, seeds, desertification, agricultural biodiversity, São Francisco River, family farming, among others), addressed in papers, reports and researches available in digital format.

The ASA conveys two newsletters. The first, called "The Lamp" (O Candeeiro) is produced by popular communicators of the organizations that act as territorial management units of the Program One Land and Two Waters (P1+2), and brings living stories on semiarid conditions, which make up a "bank of experiences well-succeed", with about 200 reports. The second, "Sharing ideas", is an electronic newsletter distributed weekly to subscribers with updated summary of the main content of the site and redirection links.

The data collection for this study listed 141 audio spots produced by ASA, whose content involves issues related to living with the semiarid and to rural women, and synopses of 80 editions of Wealth of Caatinga, a radio program sent monthly to about 230 radio stations every state in the semiarid region, along with information on the topic and tips to broadcasters. Among this collection of audios was also found one radio drama (March 2005), whose theme was access to water use from the construction of cisterns. On the website are available even two campaigns: "Tanks Plastic / PVC - Us Against!" and "Optimism Climate in Semiarid", both with pamphlets, clippings material of campaigns, advertisements and own audio spots to be replicated locally.

The ASA makes frequent use of the main social media (Facebook, Twitter and Youtube), which are simultaneously fed with information about network projects, demonstrations, actions, awards and interviews with members and farmers. The Facebook profile (created in 2011) had more than 800 accessions and much interaction with the public from discussions, comments, shares etc. On the YouTube user page were found 67 videos

produced by the Association presenting interviews, small farmers' accounts of living in semiarid conditions, ASA's shares, coordinators speeches and so on. In addition to the regional media, the ASA also has had visibility (as subject or source of information) in other nationwide vehicles such as magazines Época, Superinteressante and Globo Rural; the web portals Terra and Folha.com; telenews like Jornal Nacional and Globo Ecologia, and the daily Correio Brasiliense.

3.3. *The legacy of RMA*

The announcement of the "temporary closure" of the RMA office in Brasilia, dated 01/09/2009, on the old site's home page (www.rma.gov.br) in 2012, gave the size of the "paralysis" of the network, after 17 years of operation "in the disclosure concept of strengthening and conservation of the Atlantic Forest biome," and an informational legacy built by a dense website content and visual care[x]. An example of this was the section "Entering in the woods", which offered an interactive and didactic interface (with animated features) through which it was possible to explore various aspects related to the biome, including the history of devastation and data on ecosystems, conservation units and endangered species.

Besides informing, the site also encouraged actions and attitudes through the sections "how to report" (abuses of the Atlantic Forest), with guidance on the competence and location of each agency involved in the regulation and supervision on the environment; and "ecoatitudes" which functioned as general tips to help in environmental conservation. The news section - divided into releases, articles, calendar, newsletters and image bank - contained a file with more than 2,000 materials, whose range of content and stakeholders helped to understand the RMA trajectory and scope of action. Thus, it was possible to realize the extension of the network capillarity, the autonomy of its cells (as pointed out by Melucci) and the affinity of interests relative to the preservation of the biome and the environment in general.

While the website was kept online, it was possible to consult a database of "publications" scanned and available for download, which consists of various documents concerning the Network's activities, its strategic plan (2007) the diagnosis on the situation of the Atlantic. In the "Links" section it was possible to find a variety of NGOs and government agencies sites grouped by about 30 environmental issues. It could also take access to search the affiliated entities (called "state bonds"), with its history of achievements, thematic groups, coordination and contact. Just before the Rio+20, when RMA celebrated 20 years of existence, it has created a fanpage on Facebook, demonstrating that despite the forced invisibility, reticular relations remained active.

3.4. *Cerrado and Pantanal*

Frequent and careful navigation through the virtual pages maintained by Cerrado and Pantanal networks, between August 2011 and May 2012, allowed to infer a state of inactivity demonstrated by the downgrade of the contents and the presence of empty

topics. In September 2011, both became offline sometimes, coming online less than a week later without any changes.

While virtual interface, Cerrado Network website (www.rede cerrado.org.br) was organized in institutional sections (history, objectives, administrative structure and guiding documents), whose contents were fully available for download in pdf format. However, topics were found empty and with outdated content in several sections, including the "Press Room", which should aim to provide news about the network's actions. In addition, the number of published topics decreased each year (107 in 2007; 66 in 2008, zero in 2009; 15 in 2010, 7 in 2011, zero in January 2012). But the banner calling for membership, which gave access to the registration form, kept active.

Among the published content should be highlighted: the page "Caatinga-Cerrado Room: eco-productive communities", which articulated actions around the two biomes until recently considered the "poorest" in the country; and the "Manifesto Against the Construction of Belo Monte Hydroelectric Plant", signed and released by the network in February 2011. In further searches about the network, it was discovered the existence of the "Blog of the Cerrado Network" (redecerrado.blogspot.com), created in 2007 and fairly updated, but curiously without link in the official website. In June 2012, when the data collection for this study had already been closed, the Cerrado Network launched a Facebook page and announced that a new website was launched.

With institutional profile similar to the Cerrado Network, the website of the Pantanal Network (www.redepantanal.org) presented a brief history of its construction, general objectives and tasks set out by statute, which could be "downloaded" by visitors. You could also view the list of affiliated entities, actions taken since 2005 (as campaigns and events promoted or supported by the network), as well as an overview of information on environmental issues arising from other sources. However, in 2012 there were areas where the latest news were from two years before. The existence of a link to "Restricted Area", with access by login and password, points to the possibility of "invisible" relationships between members of the network, only researchable through interviews.

3.5. *The invisibility of Pampa Network*

The tiny amount of content (only four generic content of texts) available in the Biome Pampa Network (blog www.redebiomapampa.blogspot.com) and their outdated (the latest posts were in July 2007) made its study impossible by this way. A link to another blog (www.encontrobiomapampa2007.blogspot.com) led to some information about the meeting of the Network held in May 2007, which have not been updated since then. That is, the dissemination of information about the Network on the Web was limited to the period of its members meeting, which did not assess whether it is still active or not. It also had no profile on Twitter or on Facebook.

However, the Pampa Network held a discussion group with 69 members (http://groups.yahoo.com/group/redebiomapampa), which remained active, sending topics uninterruptedly since June 2006, although with obvious drop in participation from 2011. For being a restricted associated space, it was not possible to collect data on the group for this study.

Conclusions

The study on the six Brazilian biome-networks presented here demonstrates the differential of the environmental movement regard to the social and political appropriation of information and communication technologies, in favor of survival and sustainability of ecosystems and populations who need them viscerally. In addition to functioning as an alternative means of dialogue, technological platforms and media environments available on the Internet provides an unprecedented space of visibility, bringing resonance to social networking and creating a channel for contact with audiences.

The border transposition represented by virtual media brings to organizations and social movements networks the possibility of a broader action that is not restricted to occasional situations neither to the specific agenda of certain territories and people. The information disclosed and the communicative practices carried out on these platforms contribute to the credibility, legitimacy, capillarity and effectiveness of the network performance in face of its strategic goals.

Although its convictions and struggles are materialized in the offline world, it is from Internet pages and tools that mobilization is effective, especially in cases where the target populations are dispersed in vast and complex territories, like those of Brazilians biomes. The insertion in this visibility sphere becomes essential for the network to influence the public debate and to succeed actions, by questioning its own agendas and getting support to its proposals.

In this sense, the loss or long stagnation of the informational legacy accumulated by Cerrado and Pantanal networks, as well as the partial loss of information repository by GTA, after the fire in Brasilia office, and RMA temporary absence in virtual world, are a major setback in the activities of these entities. It is especially true with regard to its update next to the new generations, and considering the complex territories in which they operate. The invisibility moments starring these networks cause a gap from public spaces and hence from the public debate. Thereby reduce the chances in order to achieve social forces and the public policy decision makers, losing the possibility of adding partners and gain space in decision-making arenas.

Despite informational and communicative restrictions concerning their websites and their emerging use of social media, the three older biome-networks (GTA, RMA and Cerrado) still enjoy a public recognition marked by their historical social linkage, informational heritage and collective memory. It came clear from searches conducted with the names of those entities in the Web overall environment, at the final phase of this research, held days before the start of Rio+20 activities. The results revealed the networks ability to self-healing and brake water (in Melucci's sense). It was not coincidentally that these three biome-networks found in this context the opportunity to join Facebook, opening a new phase in its history, not yet assessed.

On the other hand, ASA Brazil, created seven years after ECO-92 Global Forum, in a very different context, followed a singular trajectory, compared to the other biome-networks, guided by a higher degree of technical rationalization and professionalization of its communicative activities. Data collected on this network show that it has a strategic

plan directed to the multiplication of information as well as to achieve media visibility. To do that, it makes use of both own communication vehicles driven to (and built with) the potential beneficiary populations of its projects, as actions aimed at shaping public opinion regarding the savanna and semiarid, especially through Twitter and Facebook and by approach with journalists from prestigious national media. In this sense, it differs from the other bioma-networks, which have a mindedly regional focus.

Facing all these situations, the study reveals, finally, that the informational legacy is fundamental to differentiate a "latency state" (Melucci, 2001) from a "state of invisibility", which can be confused with inactivity. The first is the case of the Pantanal Network, whose website stagnation (since 2011), with no other visible communication alternatives (such as blog and social media), remained it submerged, sustained only by its collective memory and by punctual information actions from its partners. In the second case, the biome Pampa Network appears to remains oblivious to any public communication, since a few months after its creation, against the traditionally active and connected environmental movement in this region.

Notes

i Developed with financial support from Brazilian official institutions CAPES and CNPq (2010-2012)

ii Available on: http://www.ibge.gov.br/home/presidencia/noticias/21052004biomashtml.shtm

iii Available on: http://www.asabrasil.org.br/Portal/Informacoes.asp?COD_MENU=104 (in Portuguese).

iv Not to be confused with the NGO SOS Mata Atlântica (www.sosmatatlantica.org.br).

v The Brazilian governmental institute for environmental protection.

vi Document available in: http://www.redecerrado.org.br/index.php/carta-de-principios

vii Expression referring to the territory where occurred the Paraguay War battles between the years 1865 and 1870.

viii This is not the only disagreement between the two authors. Quantitative data on the areas of biomes and occupation and preservation percentages differ almost entirely between them. As Leite does not directly cite the sources of these data, it was decided to adopt to the other biomes those used by Capobianco, usually based on official sources (IBAMA and MMA, especially) and empirical studies properly cited.

ix Available in: http://www.econewsbrasil.org/meio_ambiente/eventos/43.html. Access on: 03/22/2012.

x Data collection on the RMA website was closed in May 2012, just before the site be taken down by the rma.org.br domain manager.

References:

Aguiar, Sonia. (2007). Formas de organização e enredamento para ações sociopolíticas. *Revista Informação & Informação*. Londrina: Universidade Estadual de Londrina. (12), Special Edition. Retrieved from http://www.uel.br/revistas/uel/index.php/informacao/article/view/1776/1514

Aguiar, Sonia; Souza, Cidoval Morais de. (2007). Redes regionais de intervenção socio-ambiental no Brasil: articulações transterritoriais. In: *Anais do VII Enanpege* - Encontro Nacional da Associação Nacional de Pós-Graduação e Pesquisa em Geografia (Anpege). Niterói: Universidade Federal Fluminense. Retrieved from: http://migre.me/tXXlu

Bezzi, Meri Lourdes. (2004). *Região, uma (re)visão historiográfica da gênese aos novos paradigmas*. Santa Maria (RS): Editora da UFSM.

Capobianco, João Paulo R. (2004). Os biomas brasileiros. In: Camargo, A.; Capobianco, J.P.R.; Oliveira, J.A.P. (Eds.). *Meio ambiente Brasil*: avanços e obstáculos pós-Rio-92. São Paulo: Estação Liberdade/ Instituto Socioambiental; Rio de Janeiro: Fundação Getúlio Vargas. pp.127-165.

Corbett, Julia B. (2006). *Communicating nature*: how we create and understand environmental messages. Washington: Island Press.

Haesbaert, Rogério (2010). *Regional-global*: dilemas da região e da regionalização na geografia contemporânea. Rio de Janeiro: Bertrand Brasil.

Leite, Marcelo (2007). *Brasil*: paisagens naturais. São Paulo: Ática.

Melucci, Alberto. (2001) *A Invenção do presente*: movimentos sociais nas sociedades complexas. Petrópolis: Vozes.

Villasante, Tomás R. (1999). Cuatro redes para hacer transformaciones sustentables. *Política y Sociedad*, Madrid, (31): 37-45. Retrieved from http://dialnet.unirioja.es/servlet/articulo?codigo=154555

Submitted on: 2014/12/13
Accepted on: 2015/08/10
http://dx.doi.org/10.1590/1809-4422ASOC20140004V1932016

BIOME-NETWORKS: INFORMATION AND COMMUNICATION FOR SOCIOPOLITICAL ACTION IN ECO-REGIONS

SONIA AGUIAR
IARGO DE SOUZA SANTOS
NAYARA ARÊDES
SÓSTINA SILVA

***Abstract*:** Since ECO-92, environmental organizations and social movements have been networking with the support of information and communication technologies, in order to strengthen their capacity to influence decision-making processes relating to the causes they fight for. Some of these networks have been organized around the six Brazilian official biomes and have been incorporating the resources available on the Internet to achieve greater public visibility, capillarity and communicative effectiveness on their strategic actions. However, not all of them have been able to remain updated, active and visible in the increasingly dynamic digital environment, despite its informational and political legacy. This paper presents a synthesis of a comparative research among the here called "biome-networks", based on data collection on its organizational structures and its informational and communicative resources used to achieve its strategic aims related to the eco-regions in which they operate.

***Keywords*:** Environmental networks; Eco-regions; Regional communications; Informational legacy;

***Resumo*:** Desde a ECO-92, organizações e movimentos sociais ambientalistas vêm atuando em rede, com apoio das tecnologias de informação e comunicação a distância, visando fortalecer a capacidade de influenciar processos decisórios relativos às causas que priorizam. Algumas dessas redes articularam-se em torno dos seis biomas brasileiros e foram incorporando os recursos disponíveis na Internet para alcançar maior visibilidade pública, capilaridade e eficácia comunicativa em suas ações estratégicas. No entanto, nem todas têm conseguido manter-se atualizadas, ativas e visíveis no cada vez mais dinâmico ambiente digital, a despeito de seu legado informacional e político. Este artigo apresenta uma síntese de pesquisa comparativa entre as aqui chamadas "redes-biomas", com base em levantamento das suas estruturas organizativas e dos recursos informacionais e comunicativos que utilizam para alcançar seus objetivos estratégicos nos contextos ecorregionais em que atuam.

Palavras-chave: Redes Ambientalistas; Ecorregiões; Comunicação em rede; Legado informacional.

***Resumen*:** Desde ECO-92, las organizaciones y movimientos sociales ambientales brasileñas han estado trabajando en red, con el apoyo de las tecnologías de información y comunicación con el fin de fortalecer su capacidad para influir en los procesos de toma de decisiones relativas a las causas que dan prioridad. Algunas de estas redes se organizaron en torno a los seis biomas oficiales de Brasil y fueron incorporando los recursos disponibles en Internet para lograr una mayor visibilidad pública, capilaridad y eficacia comunicativa en sus acciones estratégicas. Sin embargo, no todas han sido capaces de mantenerse actualizadas, activas y visibles en el ambiente digital cada vez más dinámico, a pesar de su legado informativo y político. En este artículo se presenta una síntesis de la investigación comparativa entre las aquí llamadas "redes-biomas", basado en una recopilación de datos sobre sus estructuras organizativas y los recursos informativos y comunicativos que utilizan para alcanzar sus objetivos estratégicos en las regiones ecológicas en que operan.

Palabras clave: Redes ambientales; Regiones ecológicas; Comunicación en red; Legado informacional;