ABSTRACT:

The article aims at presenting the process of constitution of a social net of a regional, hybrid and multi-actor nature, guided by the concern for sharing decisions on territorial management in areas of environmental protection. The Socio-environmental Net APA SUL RMBH (Area of Environmental Protection South of the Metropolitan Region of Belo Horizonte – Minas Gerais, Brazil), developed through a project of university research and extension, constituted the first nucleus of inter-institutional and communitarian relations for practices focused on the socio-environmental liability of multiple actors, in the light of the dilemmas involving mining and industrial scale production to meet contemporary global demands and local development, aiming at environmental protection and life quality.

Key-words: Socio-environmental network; environmental conservation units; mineral-metallurgical regions; local development agents; communities; mining.
SOcio-environmental network

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SOCIO-ENVIRONMENTAL NETWORK IN MINERAL-METALLURGICAL REGIONS: diversity of interests, conflicts and perspectives.

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SOCIO-ENVIRONMENTAL NETWORK IN MINERAL-METALLURGICAL REGIONS: diversity of interests, conflicts and perspectives.

Introduction

The intensity and the speed with which mining and industrial processes of metallurgy and steelworks has been developed have demonstrated how socio-environmental problems have increased in regions where mineral resources and industrial centers are. Strategies capable of minimizing and mitigating negative impacts have called the attention of science and technology production not only by a competitive drive but also because of its aggression to the environment. The aggressiveness of these processes is configured, among other causes, by the removal of environmental resources, by the generation of several harmful residues, and by the displacement of communities.

Specialized literature shows that there is more emphasis and visibility of environmental management in industrial productive systems than in extractive systems. It may be supposed that the conditioning effect of this difference is done by the proximity with great scale consumer markets and with the pressure for process and product certification, according to the quality criteria and control of environmental impact.

The growing force demonstrated by the discourses about political participation and environmental sustainability in the socio-environmental conflicts have stimulated collective actions articulated among the affected communities, the civil society, the State, the companies, and the representation of market interests. The political criticism and the social movements promoted by entities and communities nearby the productive enterprises contribute to boost entrepreneurial actions and technical solutions in conformity with the sustainable development parameters, especially from the late 1990’s on. Among the entrepreneurial initiatives, it is pointed out those constituted as global politics for mining, according to the multi-stakeholders\(^2\) perspective. These proposals defend the promotion of global sustainability, considering the respect for the environmental legislation, more technological support to environment management, intensive training of technical staff, and


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the strengthening relationships with local communities, among other issues of entrepreneurial interest.

However, from the society point of view, entrepreneurial politics for mining has still been predominantly circumscribed to economical interests of accumulation and capital expansion. The predominance of these interests and the companies’ as autonomous social agents in the construction of their competitive politics demonstrates how unequal the conditions are for communities and civil society to participate in decisive processes of productive undertakings. The presence of the State, on the other hand, is different according to the stage of development of the countries and their economic situation. The hardness raised by the liberal economy policies, however, pressurizes to the reduction of the State when regulating the economic, productive, and commercial practices.

Experiences of socio-political arrangement constructions to promote the interaction among several agents, such as the social networks, for example, have been acquiring regional and global importance. The interest for the articulation of a network capable of promoting interactions and dialogues between the State, civil society, economic agents, and the market of the mining-metallurgical regions, has originated the research project and the university extension (Agreement PUC Minas/ FAPEMIG) which has become the object of this work.

The aim of the article is to present the developing process of the regional, hybrid, multifaceted social network – the Socio-environmental Network from APA SUL RMBH (Protected Area in the South of Belo Horizonte). Especially ruled according to the interest in sharing decisions about the territorial management in protected areas with significant mineral reserves, this Network has been developed as the first nucleus of inter-institutional and communitarian relations directed to practices that are socio-environmental responsible inclined. The institutional arrangement is defined under the perspective of dilemmas that involve the industrial production in large scale in order to attend contemporary global demands, besides the local development, with the purpose of identifying and promoting potentialities, aiming at the protection of the environment and the welfare.

The article presents as considerations on the object of this study, the purpose, and the research methodology, pointing out the constitution of networks in the socio-environmental

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3 The relationship between mining companies and local communities is historically tense due to its potential of environmental degradation. However, it has been identified processes of formal communication, environmental control, and neighborly meetings, amidst, for instance, the pressure for displacement or resettlements of communities.
perspective and, in particular, presents the development of the Socio-environmental Network APA SUL RMBH, in which processes and tasks to accomplish it and derived conflicts have been mentioned. The final considerations refer to the possibilities of the Network, in spite of the diverging interests and ambiguities present in this kind of institutional arrangement.

Description of the object under study

The project has intended to put forward a structuralizing strategy for the Socio-environmental Network based on preservation spaces of the biodiversity, the culture, and the landscape, having distinct scales of time and space as a reference for the planning. The territorial choice points out to the Biosphere Reserve from Serra do Espinhaço (RBSE)\(^4\), which comprises the APA SUL RMBH with its approximately 13% area of conservation units (CU) and State Areas of Special Protection (APE). The APA SUL RMBH embodies 13 municipal districts from the South of RMBH and registers, at this moment, more than two tens of CU’s in the categories of Private Reserve of Natural Patrimony, Areas of Special Protection, Municipal and State Parks, besides State Areas of Special Preservation, Ecological Stations, Areas of Permanent Protection, according to the specificities from the National System of Conservation Units (Federal Law 9.985, July 18\(^{th}\) 2000).

Diversity reinforces the adjustment of this region as a reference to the study of the relations between the management of the CU and the socio-economic development, having the presence of the local communities as its component. The cultural, economic, political, and technological characteristics associated to the landscape, geomorphologic, and biodiversity structures, compose a unique scenario of conservational potentialities, as well as economic activities which explicit multiple sources of conflict, in several ways.

The research in loco has focused on the surrounding communities of the CU’s, inserted in the perimeter of APA SUL. It has been selected three CU’s, which represented three instances of property and management, being them one private, one municipal, and one

\(^4\)Serra do Espinhaço has been recognized by UNESCO – MaB Program (Man and Biosphere Program) in 2005 as a Biosphere Reserve whose cultural, biological, and landscape characteristics are related, above all, to the river basins of River Doce, Jequitinhonha, and São Francisco. Its priority function is to preserve the biodiversity and the landscape, promote the sustainable development and give logistic support to educational actions, such as research and monitoring.
state, which maintain different forms of relationship with the communities of its surroundings. They are:

- State Park Serra do Rola Moça and the communities from Jardim Canada district, in the municipal district of Nova Lima and the district of Ponte, municipal district of Brumadinho, both of them near urban areas of Belo Horizonte. These districts are inhabited by workers, which functions as “dorms”, although Jardim Canada district shows high concentration of commercial activities. In this region, there are the fancy suburban condominiums, with their own projects of urbanization.

- Municipal Park of Mangabeiras and the communities of Marçola, Cafezal, and Nossa Senhora de Fatima at Serra (one of the biggest slums in town), in the Center-South Region of Belo Horizonte.

- The Private Reserve of the Natural Patrimony of Sanctuary of Caraça, CU with sustainable use, with the communities of Santana do Morro, Sumidouro, Galego, and Conceição do Rio Acima, all of them far from the urban centers, from the city of Santa Barbara, yet the first two have been considered semi-urban and the last two are located in rural areas.

Among other characteristics, it can be identified intensive pressure for the urban process, with significant expansion of the suburban residential condominiums. Its location in the Quadrilátero Ferrífero exposes the territory to an intense activity of mineral exploration associated with secondary and tertiary sector activities. The remaining activities of agriculture are less significant than that of the service or industrial sector. It is indentified still, a high concentration of factories in all economic sectors, in special of mineral exploration and industries of steelworks and metallurgy.

The data about mining allocation portrays the intensity with which mineral extraction has been done in the State. At least fifteen kinds of minerals are explored in economically feasible quantities and processes (IBRAM, 2003). The following map illustrates the mining allocations which have already been authorized in the region.
Methodology

The proposal of constitution of an Extension Socio-environmental Network looks for articulating informational technology with local leadership training under the perspective of local development of the environment. The project, defined as a research and university extension program, has adopted a methodological composition which combines scientific

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5 PAQM Mangabeiras Park; Serra do Rola Moça Park; RPPNF Santuário do Caraça; South APA RMBH borderline; Municipal Borderline; Substance (123); In red: Sand (2); pink:Clay (2); yellow: Bauxite (5); black: Dolostone (3); light blue: Iron (65); dark green: Itabirite (1); light blue: Manganese (7); purple: Aluminium Ore (1); light blue: Copper Ore (1); dark Green: Iron Ore (8); light green: Gold Ore (3); brown: Ochre (1); dark pink: Gold (19); beige: Serpentinite (4); denim blue: Mineral Water (1).
research techniques and social intervention. In this sense, the four subprojects elaborated for the (1) Creation and Maintenance of the Socio-environmental Information of APA SUL; (2) Training of Local Development Agents; (3) Creation of Web Portal of the APA SUL network; and (4) Introduction of the APA SUL Social Network and of the Permanent APA SUL Socio-environmental Forum, have been developed with distinct methodological resources. It has been especially combined collection and virtual organization of secondary data, methods of social participative research and social intervention dynamics, in order to promote connections of multi-stakeholders in a social network whose unifying element is the treatment of socio-environmental issues, being one of the them the shared management of territories for the preservation of biodiversity in regions with intensive mining and metallurgical activities, besides the pressure for urban expansion.

Through the secondary data research, it has been attempted to associate and consolidate existing technical and scientific information in a socio-environmental informational system. This system has been conceived to make the assembled data accessible to the people, including the local citizens, scientific communities; social, governmental, and business entities.

The second subproject has developed a training process for local development agents (ADL), aiming at promoting qualification for a discussion of socio-environmental problems and the formulation of local interest solutions. It was adopted techniques from action-research methodology in association with techniques from Fast Participative Diagnostics – DRP, in order to deepen into the process of knowledge production about local realities. At the same time, communities have broadened up self-consciousness and advanced in processes of permanent learning to appropriate decision taking opportunities for their own good.

An expected product in this process has been the elaboration of the informational web portal APA SUL RMBH Socio-environmental Network with its permanent forum for communication and interaction. The virtual communication tool represented by the portal has the function of making feasible and stimulating the multifaceted connections. The Socio-environmental Network in a mineral-metallurgical region attributes its functions to a dynamics that mobilizes, facilitates meetings, articulates alliances and debates, broadens communication, spreads knowledge, promotes dialogue among distinct interests, reflects upon conflicts, searches for shared solutions, and eventually promotes social relations.
Having in mind these action plans, the assumption is that the knowledge about a unit of territorial planning can be permanently re-organized and updated to guide socio-environmental actions. Among them, it is pointed out the training of local agents, the definition of preservation units, the integration of eco-systems, the formulation of trends, and future scenarios about the use of the soil for mining and urban expansion. Similarly, it can be identified and revalued the distribution of cultural diversity and its potential for relationship strengthening in a social network. Such initiatives, among others increase their demonstrative projects for the structuring of the Socio-environmental Network in other areas of intensive mining and metallurgy. Considering the notion of social networks, it is raised the assumption that the network advances in connections with other intensive mining regions in Brazil or abroad.

The initial preparation of the research staff was based on the appropriation and organization of secondary data in the Socio-environmental Informational System of APA SUL. The data system and the web portal elaboration associated specific files about the municipals, the socio-economic aspects, legal aspects, environmental aspects such as that of the fauna, flora, geology, hydrology, geomorphology, and documents such as Planning of Handling, cartography, among others, and links for the institutional database of public agencies, universities, and associated companies.

The formalization of the Socio-environmental Network Extension has occurred twofold. First, by articulating with agencies that produces data and by adding up social agents according to the segment of local government, companies, civil society entities, and university extension program. For that, it has been done three specific seminars or by segments, in order to prepare for a new agenda formulation and define institutional roles for the participation in the network. On the other hand, the process of ADLs formation had the purpose of promoting a connection in social networks, based on the researched communities and on the dialogue with the multiple agents that permeate them, with which they relate as they are affected by socio-environmental issues.

The preparation of the team for the Subproject 2 has allowed the unveiling of a research field, the involved communities and their expectations, promoting a preliminary diagnosis of a local situation. The journey has been significant due to the emphasis on the action-research (THIOLLENT, 2004) and on the techniques of rapid participative diagnostics (BROSE, 2001). According to the adopted technical and methodological conception it can be
appreciated the feasibility of the social interventions, as well as detect support, resistance, convergent points, divergent points, and people’s expectations.

The DRP involves a multi-disciplinary team that systematizes data collection in loco, putting the technical-scientific knowledge in collaboration with social groups. The DRP techniques can be considered as a way to stimulate the members of the local communities to process investigation, analysis, evaluation of obstacles, and opportunities, besides decision taking related to their own projects (BROSE, 2001). As the technique contributes to the strengthening of social relationships, it favors the training of local development agents and the empowerment of community agents.

For the participative research, the planning not only deals with future decisions, but also questions what decisions for the future are to be taken (DE TONI, 2001). This dimension reinforces the connection between research and extension as a means of knowledge construction and of technically innovative proposal formulation, for the treatment of formulated socio-environmental questions.

The conceptual technical-methodological choices articulate the dimensions of conservation with the environmental education, the management of protected areas with popular participation, the local development with leadership training, under the perspective of a socio-environmental network of action construction. The general purpose was to promote and spread knowledge besides developing technological solutions which are socially committed to the global, national and local guidance for environment preservation. In this sense, the DRP should fulfill the role of stimulating the projective capacity of the involved agents in order to instigate communitarian insertion in the construction of the network.

The priority set of techniques to accomplish the DRP in the communities has dealt with: mental maps, free or semi-structured interviews, timeline, transversal track, and participative observation. As a consequence, the DRP has provided the agents and the social organizations the practice of participative planning with an administrative tool, whose those who are involved should become co-responsible for transformation in their communities, preparing them to the future they wished (BROSE, 2001; SANTOS, 2005).

The urban and rural communities, selected for research, have demonstrated how they live with difficulties when cohabiting with conservation units and with the impacts of great urban, mining, industrial enterprises. The cohabiting does not bring, in several cases, immediate benefits for these communities. On the contrary, they can bring new obstacles for
their daily life, with structural problems enough, such as the absence of public policies of education, health, sanitation, job and income, security etc., or, not less important, by the difficulty of understanding how impacts are configured, or the alternatives that could be drawn to introduce and maintain productive enterprises.

The debate about the insertion of the environmental question has allowed the evaluation of difficulties of living together with the economic flows generated by the enterprises and by social changes. At the same way the debate can explicit the perspectives formulated by the dialogue between the communities and the academic contribution. These solutions, ruled by the social construction of knowledge, need to integrate creativity and comprise the development of appropriate technology to the reality of each community, constituting a technical-scientific and cultural collection available to the use of other communities and frequently contribute to the appearance of sustainable alternatives of job and income generation. The ADLs can act as multipliers, promoting connections between communities from APA SUL RMBH and other mineral-metallurgical regions.

These dimensions demonstrate possibilities of strengthening the social network and propose informative instruments of communication focused on local issues. Social and technological inequalities for access to the informational systems and support to the territorial management could be identified as objects for further studies and projects during the process of ADL formation.

As it has been mentioned, complementing this research action with the communities, it has occurred seminars for the insertion of other agents in the socio-environmental net. Local governments, companies, and social entities have been articulated, touched, mobilized for the socio-environmental problem in the APA SUL RMBH context. In each of the three seminars, besides proposing the network and the discussion of the thematic questions, the participants formulated together the guidance for the network continuance.

These methodological unfoldings, thus, contribute to the consolidation of the objective: the structuring project of the Socio-environmental Network APA SUL RMBH, considering the fact that the web Portal and the permanent training of the social agents can contribute to stimulating systemic thinking about the efforts, in the treatment of the complex questions of the network. Moreover, the network may contribute so that the institutions can articulate, constituting a convergent centre of several informational and monitoring systems of articulated social and environmental activities.
Social network, socio-environmental network: interactions and perspectives.

The proposal of the Socio-environmental Network APA SUL RMBH has been formalized by the implementation of the web portal of information and virtual communication to the SIS and to forums of permanent discussion, of technical, scientific and popular knowledge sharing, in order to provide the existence of a network that must be understood as a complex system of social relations. Following, it is presented references to notions of social networks with the thematic specificities aiming at giving theoretical support to the proposed construction.

The roused questions in the debate about development, citizenship, and equity have been presented as recurrent themes in the contemporary world and they bring implicit references to a complexity, as expressed by Morin (2002). Paradoxically, competition and solidarity, conflicts and agreements, confrontations and negotiated solutions, disputes and alliances, compose relationships that are manifested in the social situations and, in a special way, they indicate a context of socio-environmental questions.

The paradigmatic changes in the knowledge production, the technological innovation, the fast track for the exhaustive use of the natural resources among other factors, stimulate the long range social changes and make possible the changes of the organization forms. Among the most significant changes in the organized social systems, it can be pointed out the relations in communicational networks of integration, of strengthening of interests, of collaboration or cooperation among social agents, individual and institutionally.

Studies demonstrate that “the theory of the networks have come as an alternative to the micro-macro duality in the approach of the social phenomenon and to the dualities of the hyper and hypo-socialized social agents” (WRONG, 1961, *apud* PRATES; CARVALHAES; SILVA, 2007, p. 50). The debate emphasizes the connections, the weak and strong relationships (GRANOVETER, 1995), the social capital (COLEMAN, 1988) or like the threads of a net, as it is suggested in the biological and ecological systemic perspectives (MATURANA; VARELA, 1997; MATURANA, 1998; *et al*). For Capra (2000), the social networks are nets of communication that involve symbolic language, cultural limits, and relationships of power.
The diversity and the conceptions about the social networks allow it to discuss central questions of agent’s participation, mobilization, and empowerment. The positive effects of the forms of organization in the network are extensively dealt with by the literature and in different fields of knowledge. From the economic point of view, the entrepreneurial networks and the virtual organization demonstrated how these arrangements configure results which are related to the generation of externalities in the context of production as in the cases of strategic alliances, nucleus, APL or clusters. The civic networks (PUTNAM, 2000), on the other hand, are capable of promoting significant socio-political changes, including transformations of economic nature.

The political networks or agent’s networks act in the realm of the political-administrative systems and acquire importance in processes of decision taking in modern democracies. They reflect a relative weakening of the prescriptions and formal procedures, and are characterized by a kind of rivalry with models of hierarchical institutions, for they bring the assumption of valuing horizontal relationships.

Traditionally, the discussion around the capacity of social mobilization, in the local or regional realm, points out the concepts of leadership and empowerment as a counterpoint of its own notion of existence of leadership training. In relation to the existence of social and political networks, the dimension of resources is related to the notions of association and to the character of horizontality or verticality of these networks. According to the formulated reflection by Woolcock (1998), these dimensions allow it to think of relations in networks of three levels: the relations in the interior of a group or community (bonding); the relations between groups or similar communities (bridging); and the networks of external relations (linking).

An emphasis to this form of organization is its adoption as a political and social measure that recognizes and encourages the exercise of the local solidarity networks when struggling against poverty, social exclusion, and to promote local development. This perspective strengthens the discussion about the paths for the development and it has been stimulated by the economic and financial world system responding, partially, to the pressures of the liberalizing ideologies. This evidence allows it to rethink the notions that sustain the concept of development: the state, nationalism, and science. In the same way, it allows the replacement of the question of development in the local and regional realm as one of the strategies against the inequalities and of construction of public and social governance. This
aspect opens up alternative ways to consolidate articulations between different agents, searching for solutions capable of fulfilling needs or potentializing strengths.

What can be understood these days, at least in Brazil, is that inequality generates two kinds of search: first, it seems that it reinforces a feeling of hopelessness, which, according to several studies, increases violence. On the other hand, it is identified that there is a concern and experiments with alternative ways to the old models.

In the realm of knowledge production, diffusion, and appropriation, the networks fulfill their role as a moving force. The same occurs with the treatment of socio-environmental questions in the network, as they are also intensive means of communication and dialogue.

Social networks are capable of expressing political and economic innovative ideas that promote the appearance of new values, thoughts, and attitudes. These organizational arrangements can provide extensive circulation of information to be shared by all members or links, without hierarchies or private canals, besides favoring the culture of participation. The networks, in a few words, can allow individuals to get together, organizing themselves in an egalitarian and democratic way in relation to the objectives established in common (COSTA et al., 2003).

Whitaker (2007) states that a network structure allows a horizontal connection among its users, directly or through those who are around. The resulting group is like a textile cloth of multiple threads, which can spread indefinitely everywhere and none of us can be considered central, nor representative of the others. There are no authoritarian leaders who centralize decisions, nor subordinated; those who rule more and those who rule less. All must have the same level of responsibility that is transformed into co-responsibility, in the accomplishment of the objectives. The basic links, the threads that give consistency to a network are the information that transit in canals that connect their users. As the networks do not contain centers or different levels of power, a free circulation of information, a free horizontal intercommunication, become, thus, an essential demand for its functioning. Its members must have access to all information that circulates in it by interlinked canals. The offered possibilities by the informational science (communication speed and informational storage) can generate the efficiency of networks constituted with specific objectives and they assure the free circulation of information.
However, significant aspects of the networks are the relationships and processes of conflict and coalitions. At the same time, the agents create rivalries and internal relations of solidarity that function as a defense or ability to face other networks. For the same reason, for potentializing the ability of interest defense, the networks allow the development of a certain regional complicity in search of their own interests.

A network is supposed to offer services that facilitate the circulation of information, for instance, a secretariat or several secretariats interlinked. The function of communication facilitator and not of network manager or ruler of the network, does not give it the power to control, hide or put in hierarchy, select, censor, or guide information that must circulate. The circulation of information is also supposed to have some kind of systematic support – writing, graphics, listening or digitalized – that makes it get to the group of participants, in the rhythm and in the frequency established for them in an agreement.

People and entities interlinked in a network are established based on the identification of common or complementary objectives. Relationships in complex environments can put the agents with different aims in search of knowledge or problem solution according to their own needs. In this context of identities and differences, convergences and divergences, homogeneities and heterogeneities, conflicts and alliances, distensions and coalitions, and eventually contradictions, the networks may create forums of debate, negotiation, research, and shared solution of social problems. It is in this context that it is proposed the socio-environmental network extension.

What we name as socio-environmental network extension tries to connect different social agents such as universities, public agencies, civil society entities, management agencies of protected areas, unities of preservation, companies, communities, and its representatives. More than centering in the representation of these organizations, the network is connected by subjects that produce transdisciplinary knowledge (MORIN, 2000). In this sense, the network tends to occupy spaces and mobilize agents in typical articulations of the Third Sector, whether it is by using mechanisms of action, or by the definition of thematic areas and objectives.

The meaning of extension, in the pluralist conception, is based on the teaching/learning relation that goes beyond the university walls and its laboratories, beyond the functionalist vision that divides superior education in distinct activities of teaching, research, and extension (ROCHA, 2003). According to this conceptual dimension, extension
privileges processes of knowledge production as it rouses new projects, built by a team, after adopting participative methodologies (THIOLLENT, 2000). Besides, a university extension program must represent, as it is pointed out by Rocha (2003),

When evaluating new institutionalities of the university, Rocha (2006) shows that the importance of the privatization processes of scientific knowledge as a visible face of its crisis, associated to the effects of commoditization of education, in particular, and of globalization of the economy in general terms. Among the answers to this problem, there are the relations between the university and society that revalued traditional and popular kinds of knowledge at the same time that they identified some companies as nucleus generators of technological innovations and administrative models. Inter-institutional relations have been intensified not only with companies, but with unions, non-governmental organizations, and communities, aiming at articulating popular and professional knowledge, so that new agents establish and develop intensive relations with science and technology, what demands to broaden their capacity of participation and evaluation of the impacts.

The Socio-Environmental Network APA SUL RMBH

Having in mind considerations about the networks, it can be concluded that the constitution of a socio-environmental network in intensive regions of conflict originated from mining and industrial activities, in urban and rural areas, implies strategic and operational challenges. Strategically, the challenges are related to social mobilization in permanent processes of construction and appropriation of scientific and popular knowledge, for the solution of local problems and for community, solutions capable to socially include the conservation of culture, biodiversity, and landscapes. As a political orientation, it has become

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6 “a commitment in bigger or smaller proportions, of the university with the civil society, with the social movements, and thus being, it is important to remember that not only it takes the institution of tertiary education to its medium, but brings the university to a more profound and permanent dialogue, the social agents with whom it interacts.” (Rocha; 2003, p. 23).
Socio-environmental network

a premise the respect for the democratic space, not party driven, with the intention to maintain the forum discussions among the social agents.

In operational or instrumental terms, it is pointed out: the continuous tasks of social mobilization for the understanding of the purposes of the network; the treatment of information, generation and recognition of scientific, professional, and communitarian knowledge; availability of data and socialization of information; valorization and interchange of socio-environmental actions; qualification of agents to participate in processes of socio-environmental conflicts; the guarantee of interchange promotion in the Socio-environmental Forum APA SUL, or even further, in unities of territorial planning, in mosaics of conservation units.

In this sense, two dimensions is pointed out in the configuration of the socio-environmental network:

- The presence of agents from the productive sector, the companies that perform in the areas of mining and metallurgy. At the same extent that they create jobs, wealth, new and old materials, they contribute to environmental degradation, interfering on local life and threatening the sustainability of its operations in relation to the use of environmental resources and the search for profits, nowadays named as financial sustainability.

- On the other hand, under the logics of environmental preservation, it is pointed out the units of conservation with its justification for the establishment of reserves or protected areas. In connection to the CUs, there are communities and organizations of the civil society and, not least important, the university with its wide range and research and extension projects.

The management of environmental conservation units is revealed as an exercise of conflict confrontation of several aspects, such as, for example, associated to the limitations and restrictions to the use of natural resources and the relationship with local communities. It can be said, thus, that inhabitants near the conservation units, since they are informed and trained, are the most indicated ones to follow what is going on in the place where they live (DIEGUES, 2001). Gathered in networks and interacting with other agents involved in the management of these units, this situation is potentialized, new knowledge is generated, and new agreements are established. Recent studies show the emergent trend of empowering those who has the legitimacy of traditional knowledge, in other words, of the local communities of the conservation units of integral protection and those that inhabit protected
areas of sustainable use. In this conception, the informative and training processes point to an opportunity to strengthen the management of the CU’s, embodying cooperative dimensions with the communities. Due to the recognition of these complex dimensions, especially related to conservation, it is defended the articulation of the ecosystem management with the peoples involved in the territory. Several authors emphasize that the success or the lack of it in processes of ecosystem management for environmental protection, economic revival or the restoration of life in communities, starts and finishes with the people and its choices. It is still pointed out that this goes beyond databases, ecological classifications or mere technological solutions.

The complexity tends to broaden when such relations occur in areas of recognizable mineral potential, projecting the impacts over the occurrence and use, appropriated or not, of natural components, transformed into hydro and material resources, besides the lifestyle of the urban or rural populations. It has become essential under these circumstances to overcome the limits of knowledge association to the process of complex decision taking, with divergent interests.

This vision allows us to consider the political involvement of relevant social agents that report conditions to the decentralization, inter-sectoriality, and democratization of choices, tending to extrapolate the limits of institutional initiatives, that tend to reduce the decision taking processes and the information evaluation of late consultations. Traditionally, the processes of political implementation, plans, programs and projects put the local community knowledge in a second place due to the reach of pre-defined goals in hetero-generated processes. The social networks, on the contrary, outflow complexity as they allow the dialogue, the debate forums, and the consequent valorization of knowledge appropriated throughout life that join different dimensions, translating the socio-economic, environmental, behavior and socio-dynamics, local and regional. In this area, although for many traditional knowledge does not seems to contain scientific basis that credentialed them, they have the ability of integrating dimensions different from the environment in a way that the disciplinary research, limited to short deadlines, do not have the possibility of appropriating it (GEO BRASIL, 2002).

It has been in the context of shared knowledge production and based on principles of participation, de-centralization, interdisciplinarity, recognition of plurality, cultural diversity that the Socio-environmental Network APA SUL RMBH has been created. It has been
searched to associate access to information, scientific and traditional knowledge, narrowing the relation between the scientific community, professional community and the local population in order to face environmental conflicts. Developing the debated forums was a way to encourage initiative in the communities, the partnership with the university, the companies and the public institutions in order to potentialize socio-environmental citizen action of these populations.

Every moment, it has been tried the institutional union and the establishment of an agenda for the configuration of the hybrid, thematic, regional network, composed by agents with different interests. To reach such objectives, the main tasks involved, among other: the publication of the Socio-environmental Network Web Portal; the participative establishment of the conceptual basis of the Network and the Socio-environmental Permanent Forum from the communities of APA SUL RMBH; the formulation of a mission statement and an action plan; the definition of the attributions and responsibilities of its team; the search of partnerships for project implementation; the workshops of communitarian experience exchange

Among situations of conflict, dilemma or antagonism that mark the territory, object of this study, it can be pointed out: the configuration of mineral extraction and metallurgical activities, as one of the most significant sources of tax collection and state stock finance; environmental degradation due to the activity in itself, independently of the technology adopted to recover explored or degraded areas and of the discourse of sustainable mining, as it is defended by the respective companies; the socio-environmental demands and the movements for the preservation of biodiversity, full of paradoxes for having their actions financed by main agents who intensively use natural resources; the strategies and practices of environmental preservation, public or private, whose sustainability depends on agreements of several agents and the financial support from the productive initiatives, demanding the construction of strategic inter-sectorial alliances; and last, but not least, the complex condition of human urban or rural communities in situation of social vulnerability where contradictions between the impacts of unequal economic development and negative external aspects live in these regions. The environmental degradation threatens displacement, social instability, loss of traditions due to the intensive mineral and industrial activity. The craving for economic solutions for family life implies, many times, surrender to the pressure, what
can take them to a lack of options to remain in their region and lead them to migrate to the outskirts of the urban centers (PEREIRA et al., 2010).

**Final considerations**

The initial objective of structuring the Socio-environmental Extension Network in mineral-metallurgical regions has been achieved, considering the territorial extension of the APA SUL RMBH, object of this study. The public product that formalizes the results of the research is available in the web site <www.redeapasul.com.br>. However, the results in favor of social mobilization for the shared management of environmental preservation are the most important aspect.

The process under investigation and the university extension here developed have allowed the identification of opportunities for learning about the complexities of socio-environmental issues when revealing the different agents with their own interests, roles, and above all, the potential for co-existing conflicts and problems in multifaceted regions, such as that of APA SUL.

The initiatives for constructing the Socio-environmental Network have brought to the scene the assumption that the group of agents promotes significant actions from its point of view but it is not necessary enough for systemic solutions, as the institutions that generate them dominate parts of the cycles or of the processes. In the case of the companies, their proposals of environmental compensation or obedience to legal environmental conditions traditionally attend to their conditions to treat socio-environmental problems. In the case of public institutions, their fragmented actions are just projected instead of promoting integrated solutions: some of them perform as technical support, others as professional training, others offering credit or micro-credit, others with the management system, yet the system, generally remains disarticulated.

Some established tasks for the consolidation of the Network need to be continued. Among them, it is pointed out: identification of agents that can join the Network; mobilize its participants; promote and stimulate the participation in discussions, thematic groups and other activities proposed in the portal; search for partnerships to implement projects; promote connectivity for digital inclusion in the districts and communities aiming at the access and integration to the Network; diagnose the centralities and the outskirts that can interfere in
non-governmental organizations, communities, and other pertinent agents. This last action suggests the continuity of the research on the potential influence of the civil society entities organized over conflicting questions in regions that mingle priority areas for potential conservation and intensive activities of mineral extraction.

The main perceived limitations in the research process are related to the short time allotted to experimentations of the actions in the multifaceted social network so that it is made capable of reflecting on its connections, its conflicts, and on the efficiency of the communication systems. The question related to the territorial planning in the realm of APA SUL RMBH is an example of a polemic and a level of interest conflict when the adoption of a process of ecological and economic limitation is discussed in order to be implemented because of the law, to regulate the forms of use and occupation of the soil. The confrontation of this question elevates the potential of exposing contradictory interests between mining and its institutes, the communities, entities related to environmental issues and the public sector.

The study of social networks, specially, of the thematic and multifaceted network, can be undertaken under the perspective of the presented justification by the institutional directors, from the point of view of the company to reveal its discourses and, in them, its interests. Once more, the multi-stakeholder perspective of action may have a special place in the configuration of studies that point out ways to mining in a global level, in other words, that generates global politics capable of renovating routes for conflict solution and for the exercise of corporate socio-environmental responsibility.

The constitution of the Socio-environmental Network APA SUL RMBH brings in itself the expectation of new projects, aiming at constructing knots of this net in order to deepen into studies about municipal and regional realities, with the diversity of conflict that are established and permanently transmuted, demanding new socio-environmental kind of knowledge.
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