

Economy Transdisciplinarity Cognition <a href="http://www.ugb.ro/etc">www.ugb.ro/etc</a>	Vol. XIII, Issue 1/2010	34-47
---	----------------------------	-------

## **CONCEPTUALIZATION AND APPLICATION OF METHODOLOGICAL ALTERNATIVES IN THE ENVIRONMENT AND SOCIETY**

**ELZA NEFFA,  
ANTONIO CARLOS RITTO**

Universidade do Estado do Rio do Janeiro, BRAZIL

[elzaneffa@hotmail.com](mailto:elzaneffa@hotmail.com)

[ritto@terra.com.br](mailto:ritto@terra.com.br)

**Abstract:** *That article considers the approach of Methodological Alternatives in the Environment and Society, created by Neffa&Ritto, and presents its application in the process of Environmental Education developed with education professionals and small rural producers living in locations within the Project "Knowledge Forms and social-environmental practices: integrated action in the hydrographic basin of the Rio Preto/ Region of Medium Paraíba do Sul", Brazil. The adoption of such a methodology seeks to relate social actors and citizenship and with the elaboration of public policies, with a view to contributing to the improvement of informal teaching of the sciences and the creation of strategies towards community participation for the increment of sustainable productive activities. The research interventions accomplished are based on the renewal of the research-action methodology, whose centrality intends to dialogue with local development where it nears the science of a praxis built by the very actors / researchers, and where this same methodology bears interrogations about the purposes of the research-action itself. An environmental education linked to Social Technology initiatives, which come as a possibility to reformulate the representation of nature as built in modernity and the logical assumptions that assure prioritarily economic development (production and consumption models) in detriment of the (re)production of life on Earth and of the human evolution, comes as a social praxis from which emerges the idea that the transformation of the relationship human being x nature depends on the established changes in the local social dynamics – mainly in those where social actors are involved in generating productive activities of labor and income. The application of the methodology ALMAS happened based on participative management of projects (research-action) and in a transdisciplinary perspective, with a view to the socialization of scientific knowledge, traditional techniques and sustainable productive practices, necessary to the human development and environmental sustainability.*

**Keywords:** *Transdisciplinarity, Participative Methodology, Research-action, Environmental Education, Social Technology, Local Development*

### **1. INTRODUCTION**

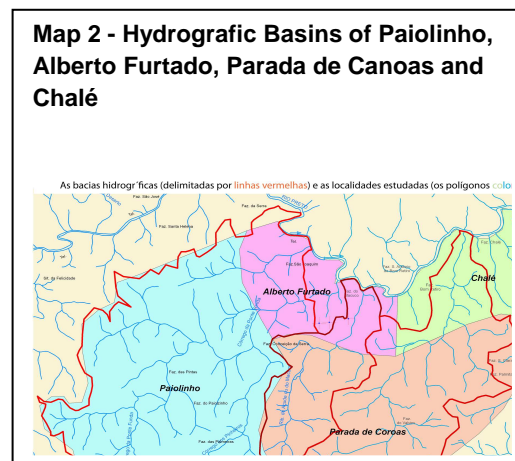
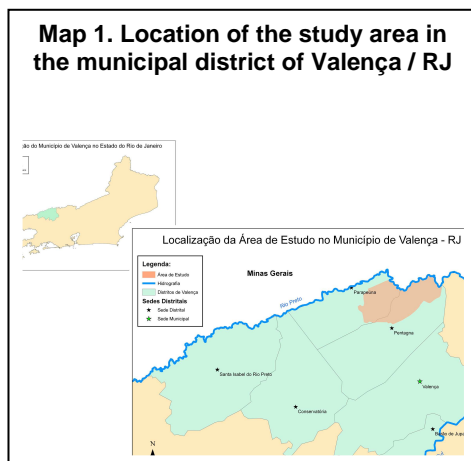
This Paper presents ALMAS, i.e., Methodological Alternatives on the Environment and Society, created by Neffa&Ritto, and presents its application in the process of Environmental Education developed with education professionals and small rural producers of Parada de Canoas, Paiolino, Chale, Alberto Furtado and urban area of Parapeúna, a municipal district of Valença, in Rio de Janeiro, Brazil, all of which lying within the reach of the Project "Social/environmental knowledge and practices: integrated action in the hydrographic basin of Rio Preto, in the region of Medium Paraíba do Sul"<sup>1</sup>.

In this Project environmental education is understood as a political praxis as it articulates itself with the productive dynamics of social relationships, since social actors are involved in activities that generate labor and income. The involvement of the actors in this educational process attempts to

---

<sup>1</sup> Research project coordinated by Professor Doctor. Elza Neffa, in the period of May 2007 to September 2008, with support of the Foundation for Research Aid of the State of Rio de Janeiro - FAPERJ.

relate organizations with citizenship and with the elaboration of public policies, in order to contribute to the improvement of informal teaching of sciences and to give rise to strategies of community participation towards the increment of sustainable productive activities. The perception of environmental education as an instrument of social transformation indicates a permanent learning process capable to contribute to the understanding of a multidimensional reality, starting from the multi-referentiality of subjects active in social and environmental complex systems (Nicolescu, 1999). The research field that involves environmental issues not only incorporates and inflects the concepts and methods of different scientific fields (ecology, anthropology, history of the religions, education, political science, among others), but it also admits, in the analysis of the phenomena, biophysical causes as much as social ones, widening the borders among social sciences, natural sciences, philosophy, the arts, religion and traditional knowledge, starting from the representation of the environment as a space of articulation of natural and social processes consisting of different materiality orders and rationality spheres, with a view to valuing sustainability conditions of life.



The solutions to the current problems demand paradigms different from those that generated them. New sensibilities and new civilizing meanings, critical, solidary and autonomous stands that subsidize social participation, the exercise of citizenship and the transformation of economic and technological processes are some postures that enable us to face capitalist forms of dominance and alienation, which makes room to overcome the hierarchy between scientific knowledge and traditional knowledge and for the implementation of productive practices that result in social inclusion and human emancipation [Santos (2000); Castoriadis (1987) and Mészáros (2002)]. Aware of those needs, Neffa&Ritto, based on Social Technology movement, enlarged the theoretical presuppositions of the Research-Action approach, formulated by André Morin and Michel Thiollent, who incorporated new methodological alternatives in the environment and society (ALMAS) into educational activities which, when addressing labor qualification and the potentialization of sustainable productive knowledge and practices, require a science of praxis built by the very social actors.

The perception of human beings as embedded into relations that when transforming nature through labor and technique, transform themselves and the concrete conditions of their lives (Lukács, 2007) is fundamental so that pedagogic actions that result in emancipation and citizenship are implemented seeking and ethical-responsible involvement of each human being in the process of human development and of environmental sustainability. When articulating social practices and labor issues seeking alternatives towards survival needs and the integral development of human beings, Environmental Education initiatives in hydrographic basin of Rio Preto come as instruments of enlargement of ecological awareness and the socialization of knowledge that allow to create solutions for the problems that affect small producers, public managers, education professionals, and communities. The adoption of new mentalities and productive dynamics that integrate the human being into nature contributes to the reeducation process of those actors vis-a-vis the predatory exploitation of natural resources, the forms of participation of society as a whole and also unsustainable economic models. To establish a new pedagogic mentality presupposes the assumption of ethical and political commitments that, being based on a complex form of thinking (Morin) may

point towards emancipatory alternatives and roads to a participation and cooperation culture giving rise to a solidary network and a humanization process.

The presuppositions of the methodology are capable of stimulating formative processes of networks of actors able to trigger changes in behavior related to the use of the natural resources and to social and environmental practices linked to labor and income generation, health, education and sustainability, which has been contributing to the sustainable development of this hydrographic basin. Geo-reference techniques, meetings, seminars, workshops and interviews favored the construction of the scenery, and contributed to the enlargement of the social actors' perception in relation to the possibility of their transmuting historical social domains starting from the appropriation of methodologies and techniques to articulate traditional knowledge and scientific knowledge. At the time this research started, the social actors of that hydrographic basin anticipated the concrete possibility of transforming agricultural commodities into preserves and compotes, with a better durability that may allow for its commercialization no matter the condition of highways, the viability of enlarging the cultivation of medicinal and aromatic plants available in home-made kitchen gardens for the production of teas, sachets and dyes, as well as the production of ornamental crafts, among other activities favoring labor and income generation.

The application of that methodology in the research proved that a common emancipation sense might come into play (Santos, 2000) starting from the construction of production alternatives that may develop people's talents and methodological localities potentialities, because social actors build their political identity when they transform the social structures that are on the basis of the material conditions of their own existences and also when they promote local development and quality human relationships based on the respect for those values shared by the people involved in the dynamic connection process of diverse scientific knowledge to the knowledge involved in the action (based on experience and spirituality).

To create alternatives in environment and society is the challenge to be faced by all those who are seeking to overcome that natural resources are infinite, to reformulate the representation of nature built in modernity and the development patterns linked to the logics that assure prioritarily economic development (production and consumption models) in detriment of the (re)production of life on Earth and of human evolution. The hydrographic basin as a whole, which encompasses the physical and social realms, the political and economic system and the available technology, was the object of study of researchers active in several areas of knowledge with the University of the State of Rio de Janeiro, namely UERJ, being the concept reinforced as a transdisciplinary subject as it presents multiple dimensions (levels of reality) that are seen from the several perceptions held by these researchers- educators, geographers, biologists, social scientists, IT experts who, together with the local population, attempted to face the challenges of the emerging reality of a globalized world.

To understand the hydrographic basin, the landscape was dimensioned as a complex concept with multiple meaning levels, a cultural text of several dimensions that is directly linked to the perception of the world, serving human beings as a guide to their actions towards changing the environment. In an attempt to discover and to explain the order within the multiplicity of relationships that happen in the landscape, more than understanding it the conceptually, we intended to identify landscape indicators that may be found in the different techniques and materials used in the production process of small rural producers lying in the hydrographic basin of Rio Preto, which ultimately reveal the cultural attributes in their social and environmental practices that reflect understanding that they have of nature.

For Milton Santos (1994: 68-69), the landscape is a type of a mark of the history of labor and techniques, but it is not reduced to it, and should be thought along with the political, economic and cultural conditions once techniques have an important role, but it does not have an historical existence outside social relationships.

## **2.1. CHARACTERIZATION OF THE HIDROGRÁFIC BASIN OF THE RIO PRETO**

The Rio Preto is an indirect tributary of the Paraíba do Sul river, being of great importance in the Medium Paraíba region. With an extension of 198 km, this river starts in the Mountain ridge of Itatiaia and, along its course, it separates the states of Rio de Janeiro and Minas Gerais, running into the Paraíba river.

No industrial residues are polluting agents in the hydrographic basin of the Rio Preto, which is representative of a rich history and traditions. The environmental degradation of this hydrographic basin may be identified by water pollution due to the absence of effluent treatment and unproper discharge of solid urban and rural residues, affecting water quality, and erosion and sediment production, a consequence of the systematic cutting of vegetation covering large areas used for growing, as well as soil handling with archaic techniques, such as the burning of vegetation, among others, that affect water volume, provoking an increase in the frequency of floods and the impairment of living conditions due to the increasingly higher hydric risk of the Rio Preto.

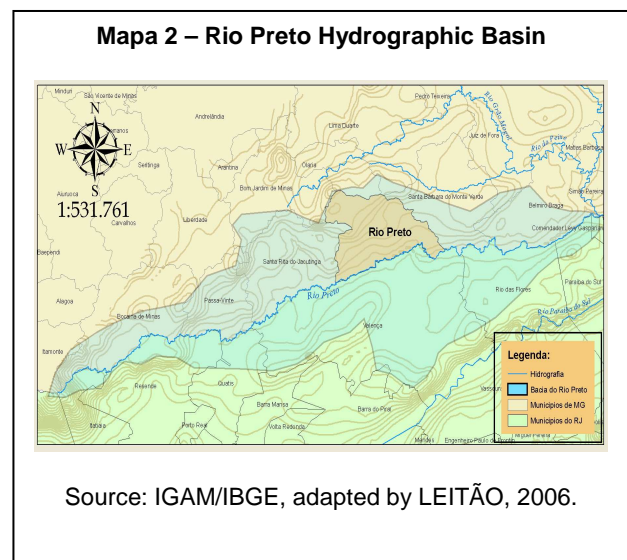
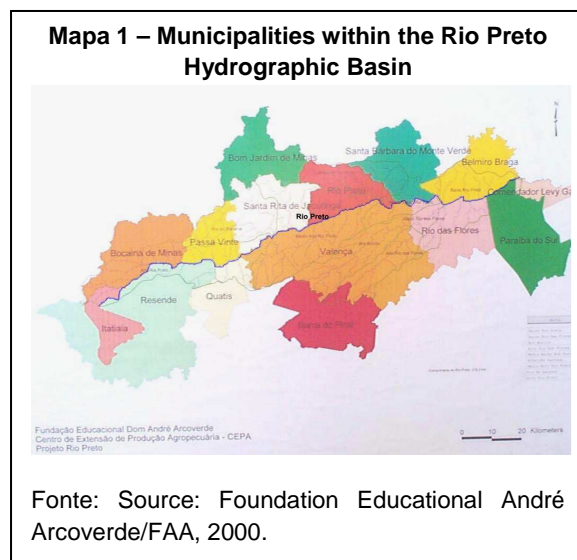
With the hot and humid weather, the devastation of the forests for coffee plantations in the XIXth century favored the erosive process in that basin hydrographic once, without the protection of the forest, the lands were much more exposed to weather conditions.

The persistence of that deforestation during XXth and XXIst centuries for the increase of cattle raising activities, which does not demand such fertile soils, threatens the health of important streams, rivers and fountainheads that irrigate the area of this study, since the region does not have Conservation Units that may help halt environmental degradation.

The regional morphology is framed by cattle raising activities as grazing provokes gutterways in the soil, helping rain drainage, forming small ponds along cattle routes, and giving rise to gullies.

The substitution of the coffee plantations for agribusiness and cattle raising modified the mechanisms accelerating erosive processes.

The lack manpower accentuated soil burning to open room for grazing, exposing the soil



directly to rain and erosion. Soil burning done by during dry weather leaves the soil unprotected when the first summer rains come..

Another severe environmental problem affecting the hydrographic basin of the Rio Preto is the obstruction of rivers by sand and other sediments, which is called silting. River silting may provoke large flooding, as has been the case in the region for many years now, mainly in the cities of Paracatu / Valença-RJ and Rio Preto / MG, both in the Rio Preto basin.

## 2.2. HISTORICAL AND ECONOMIC FUNDAMENTS

In the XIXth century, in the Medium Paraíba river and its sub-tributary - the Rio Preto - coffee plantations abounded for export, conforming the region and providing the Province of Rio de Janeiro with the condition of an important economic center in Brazil.

In the XXth century, coffee plantations gave way to a two-fold industry with the industrialization of the Medium Paraíba and the implementation of agribusiness and cattle raising activities in the hydrographic basin of the Rio Preto. This basin is characterized by the development of agriculture and cattle raising in the municipal districts in Rio de Janeiro - Valença, Rio das Flores, Quatis, rural areas of Resende and Itatiaia, as much as in the municipal districts of Minas Gerais State - Bocaina of Minas, Passa Vinte, Santa Rita de Jacutinga, Rio Preto, Santa Bárbara do Monte Verde,

Bom Jardim de Minas and Belmiro Braga. No matter how much the region partly lies in the State of Rio de Janeiro and partly in the State of Minas Gerais, there is little difference in culture between both, where traditionalism and conservativeness prevail in social relationships and in handling natural resources.

An economic comparison of those intra-regional areas within the Medium Paraíba river shows a high percentage of industrial activities for the regional income - 83.56%, in opposition to the spaces where it grows the farming, that only incorporate 1,59% to the total of the income of the area. The those data the tertiary section is added, responsible for 14,85%, and the fact of that reality to be hidden by a development image that homogenizes the area as a completely.

### **2.3. PROFILE OF LAND OWNERSHIP**

The Rio Preto hydrographic basin land ownership profile shows a high number of small properties (smaller of 10ha) and of intermediate properties (between 10 and 100ha). The analysis of the demographic (People/km<sup>2</sup>) density of the municipal districts of the Medium Paraíba indicates the diversity and complexity of the region.

The municipal districts whose activities are markedly industrial and/or that participate in the economic dynamics of the region's industrialization process present a high demographic density, in other words, 168.61 People/km<sup>2</sup>. The municipal districts whose economy primarily relies on farming activities present an extensive area, with 2,917.5 km<sup>2</sup> and a low demographic density, 31.63 people/km<sup>2</sup> as it is the case of Rio das Flores and Valença. With around 15.9 people/km<sup>2</sup>, distributed in a 479.5-km<sup>2</sup>, area Rio das Flores has the smallest demographic density rate in the region. The municipal district of Valença, in its turn, although holding the largest regional territorial extension (1305.8 km<sup>2</sup>) has almost half of the demographic density of the municipal district of Resende, in whose 1100.2 km<sup>2</sup> area holds an expressive industrial park.

If on the one hand the region implemented a domestically expressive industrial park in the Paraíba do Sul river basin, on the other hand the modernization of farming activities, widely implemented in the Brazilian territory from the 1950's to the 1970's was not enough to guarantee economic improvement of small productive units, largely family businesses lying in the hydrographic basin of the Rio Preto. Besides funding obstacles, small properties present an uneven topography referred to as "sea of hills", hindering the use of machinery and stimulating traditional techniques.

### **2.4. RIO PRETO Hydrographic Basin Business Trends**

Migration emptied whole populational areas within the Rio Preto hydrographic basin and reduced any likelihood of productivity increase, although hundreds of small owners' families produce income through the development of farming activities, producing:

- Milk (marketed in natura, cheeses and sweets);
- Sugarcane (transformed in handcrafted white rum in home-made stills);
- Fruit growing (guava, passion fruit, jaboticaba, banana, mulberry, star fruit, cajá-mango, among other fruits are processed into compotes and liqueurs);
- Fish farming (tilápia and carp);
- Beekeeping (bee honey);
- Legume growing (vegetables for in natura marketing and pickles);
- Forestry (native essences and medicinal and aromatic herbs);
- Craftwork with banana trees fiber, corn straw fiber, seeds, among other natural materials;
- Rural-historical-ecological tourism.

However those activities characterize the autonomy of those small producers, they do not constitute their emancipation, as their rudimentary production only allows for a small income generation, given the lack of processes to make possible the generation of surpluses to be marketed in domestic and foreign markets.

### **2.5. SMALL RURAL PRODUCERS AND LOCAL SOCIAL AND ENVIRONMENTAL PROBLEMS**

It is mandatory to justify our concern concerning Small Rural Production. This niche in Brazil is responsible for 70% of the economically active population in rural areas and for 20% of the national workforce. The data of the Agricultural Census of IBGE (1985) informs that farming areas with less

than a hundred hectares total 21% of all farming areas and respond for an expressive agricultural production in the country.

Small producers are dispersed within the whole hydrographic basin of the Rio Preto. They develop production relationships based on their own workforce to produce subsistence crops, presenting a precarious life condition and need to build pathways for productive to improve their lives.

Real situations show small producers differ greatly, showing complexity and multiplicity, being a heterogeneous mass composed of permanent workers, part-time workers, small owners, leaseholders, tenant land partners who have insufficient conditions – be that in the form of land or work tools – for their family farm business, which means they have to resort to part-time jobs to meet their family needs.

To overcome production and payroll hardships, small producers rely on the workforce of their families. In general, family members cooperate in the productive process, being men the prevailing workforce in preparing fields for planting, weeding, sowing, cattle raising, harvesting and product marketing.

As production is diversified, and men usually move to pre-sales and sales activities, women end up being responsible for running the business, household chores, and farmwork, not always accomplishing the lightest tasks, although men remain being considered the breadwinners. Women's presence is more significant in manual tasks, in the care of animals, in kitchen gardening and in manual processing such as corn grinding, and foodstuffs like candies and cheeses, among others, although they usually participate in milking activities. Practically without the help of men, women are solely responsible for raising the children who gradually become part of the workforce as the heirs of the family network, should they decide to remain living on the farm.

An important expression of the personalized character that conforms social relationships is mutual help and collective work. Relationships based on family ties, friendship and camaraderie they are characteristics of relationship networks among landowners. They usually believe in solidarity, which although not excluding conflicts, individualism or intolerance, allows for mutual help, in case of need.

Concerning land, it does not only imply net worth, but also a production means, and small producers are linked to it with their very own traditional culture, which demands behaving beyond the established rules governing the exchange of merchandise, i.e., much symbolic significance is present. The great challenge for small producers consists of developing family strategies in order to assure their own reproduction and that business keeps going on. In the hydrographic basin of the Rio Preto, the precariousness of the establishments and the impoverishment of small producers, owners of land smaller than 10 hectares, became markedly worse due to the fact that cattleraising relies most on cattle for milk as the main economic activity. In general cattle raising is highly valued, cattle for milk and livestock-raising alike, but these small producers may not be characterized as small cattle raisers. Commercial exploration and conservation of nature is predominantly traditional in farming and cattleraising activities, and environmental preservation, where techniques applied are rudimentary.

Small producers live on their farming activities lacking basic infrastructure in different sectors. According to the problems identified by small rural producers of the municipal district of Valença, in Rio de Janeiro, to become part of the Participative Urban Master Plan of this municipal district (Complementary Law 62/2006) face serious difficulties, such as:

- in sanitation, with water supply deficiencies (water analysis and treatment), sewage deficiency demanding septic tanks or alternative systems (such as dry sanitation system) and garbage disposal (poor guidance towards handling and final destination of poisonous products packing, supply of proper trash can depots for solid residue on the part of the municipal administration);
- in transportation, with the lack of highway maintenance (cleaning gutters, sewage pipelines, patrolling, road maintenance, nt of drainpipes, prepare and maintained streets, scum placement and of signaling) and of new lines and schedules of bus;
- in education, discontinuation of rural schools, inadequacy of curriculum and calendar for the rural area, inexistence of courses appropriate to the local reality and the needs of students who concluded the basic cycle the lack of middle school courses, Rural Environmental Education and professional training - craftwork, cooking (sweets, cold cuts, cheeses, seasonings, bread-making),

- rural administration, fish farming, beekeeping, medicinal plants, ornamental and aromatic plants, essential oils, hostelry and rural services, among others;
- in health, medical services, dental care and social assistance, and the difficulties to implement preventive medicine programs, Family doctor support, rehab care for alcoholism, smoking and drugs, dietary habits and vaccination campaigns, preventive campaigns on AIDS, hepatitis, influenza, conjunctivitis, filariasis, pregnancy in adolescence, contraceptive methods etc.), the inclusion senior citizens in aid programs, and fast-track courses on accident prevention, markedly Industrial Protection Equipment concerning toxic substances, medicines, vaccines, machinery, equipment, vehicles and implements in general;
  - in agriculture, difficulty to purchase implements (seeds, vaccines and fertilizers at compatible costs with the low value of the sale of the product on the market) and of appropriate agricultural equipment to the production (trucks, patrol, retro-digger, bulldozer, Bauer, vehicles in general);
  - in technical support for adequate land handling and irrigation practices, correction and fertilization, as well as for the diversification of the crops and new activities as fish farming, beekeeping, sowing, vegetable farming, poultry raising, sheep raising, plant sowing for craftwork and landscaping, reforestation etc.;
  - in communication due to the unavailability of fixed telephony, radio, cellular, TV antennas, mail and telegraphs etc.;
  - in safety, lack of integration of the Military police, Civil, Forest and Fire brigade, patrolling, communication means between the rural residents and police stations, sheriff's office etc.);
  - in farming policies, lack of projects, planning and funding policies; lack of articulation with Farming and Environmental agencies and authorities Unions, Universities and other Teaching Institutions, Associations, Dairy products processors, Cooperatives, among others; inefficiency in pest control, and the lack of health issues campaigns; little participation of rural organizations in Municipal Council addressing farming policies; lack of social, economic, environmental diagnosis in rural areas; deficiency of guidance in environmental issues, land ownership, social assistance, labor and tax, associativism and farming issues as a whole.;
  - in marketing products, given the precariousness of unpaved roads and intermediation costs;
  - in environmental issues, the need of effluents treatment through the construction of leachate tanks and/or biogas plants in cowshed, barns for swines and birds (b) recovery and preservation of forests and bank river vegetation and reforestation with native species, of protection springs and waterheads; (c) diffusion of ecologically-friendly farming, and sustainable development with application in vegetable gardens and organic farming, organic livestock, organic milk in dairy processing. Use farming surplus as animal feed.;
  - implementation of initiatives of environmental reconstruction and ecological reorientation of properties and conservation, protection and valorization of water with the construction of dams, water rain depots, ditches to wall water rain in highways, besides special programs for the reconstruction of the water fountains and protection of springs, with reading material back-up, such as "Producing Water";
  - in tourism, difficulty for tourists to access historical and cultural sites and scenic views and the lack of information through TV, radio and press campaigns, and specialized guides; lack of preservation of the historical farms, monuments, bridges, tunnels, belvederes, trails and roads; with the little legal protection of historical sites and their use for cultural, artistic and touristic activities.

Along with all these problems, small producers face challenges to increase their such as the low use of pastures in the winter for cattle feeding; incorrect pasture handling; lack of fertilizers in pastures; low use of animal feed prior to pregnancy; improper animal feed supply; lack of soil analyses to correct acidity; insufficient brucellosis shots; insufficient workforce supply to answer for increased production demand. To add to the problem, the lack of local planning for farming activities, tax rebate incentives to foster production and the difficult access to bank loans, granted through projects financed by government agencies. As for settlers, the unwillingness of landowners to lease land and allow for small farming (beans, corn, sweet potato, cassava, among other basic livelihood products) has been driving workers towards public policy programs such as the Federal Government's "Family Support", to complement income and very often supply all family needs, when this is a family's only income.

Although quite degraded by farming activities, the hydrographic basin is of great importance in the context of the Medium valley of Paraíba do Sul since rural workers tend to have a sense of contribution to improve environmental conditions, enabling therefore: (a) a better ecological awareness through the appropriate handlings of the renewable natural resources; (b) the improvement and maintenance of the productive potential of the soil, through practices as organic handling, proper use of pesticides, plateau farming etc; (c) the improvement of water quality for human use and irrigation, through practices towards improving underground water supply; (d) increase of sustainable farming and activities that seek social and economic growth in rural areas; fostering labor supply, stimulating initiatives to dodge migration from the country to cities; (e) enhance initiatives towards rural development with the participation of communities and local governments. Protection of water sources and river bank vegetation is also the concern of the small producers, which they regard as social, and environmental sustainability (Calazans, Neffa and Novicki, 1998: 247-259).

### **3. THE METHOD AS STRATEGY OF EMANCIPATORY ACTION-TAKING**

As opposed to the epistemological positivist interpretation of knowledge, which gave rise to the current civilization crisis, social and environmental problems emerge due to the critical models of partnership prevailing in modernity, provoking the need of building another social rationality where the human being is the center of the development praxis. This change in values and the formulation of a new paradigm to reinvent solidarity through a knowledge capable to enable the several subjects to exercise social practices that lead to actions of individual and collective citizenship and the incorporation of a new knowledge bearer of emancipation.

The development of projects, undertakings and social initiatives, in general, is more successful when the whole process is made public, mainly in decision levels, when actors share the same value inception, knowing and influencing the perception of problems and those inherent means to handle reality.

According to Santos (2000), when social regulations started, those concerning farming activities have been the most neglected ones in the last two centuries and exactly because of that y for that were the ones that were least obstructed by legal determinations being, which provides room to establish a dialectics with emancipation onsets: participation (political dimension) and solidarity (ethical dimension). Along with that, the importance of networking to create communication (internally and externally), realms where experiences may be exchanged, allowing for the accomplishment of events, the establishment of alliances and projects and the formulation of strategies to exercise larger influence within public policies.

Behavioral changes demand the adoption of educational strategies that, as seen here, are recognized as an understanding process, political practice and democratic commitment that the civil society should assume as the onset of citizenship (Freire, 1997).

Under the perspective of promoting social transformations and to reach communities, seeking sustainable initiatives that might point towards solutions for the problems concerning social and environmental responsibility, the methodology here presented approaches presuppositions of contemporary science (Einstein, Planck, Heisenberg, Bohr, Pauli, Prigogine, among other physicists of the century XX) as addressed in the theory of complexity (Edgar Morin), in social ecology (Félix Guattari), in organic intellectual development (Antonio Gramsci), in transdisciplinarity (Basarab Nicolescu), in emancipation knowledge (Boaventura de Souza Santos) and in research-action (André Morin).

The reconstruction of human relationships and the organization of micro-political and micro-social practices based on a new solidarity that respect personal and local cultures depends on the construction of new conceptual and methodological references postulating cooperation, connection and dialogue between several disciplines and the applied integration among scientific and non scientific knowledge. It also depends on the perception of the world as dynamic and dialectic realm - a totality in constant flow of energy, of events and of processes in transformation - and as a net of relationships in which all parts of the universe are founded in an interdependence of physical and anthropological and social phenomena.



The reconstruction of those conceptual and methodological references that foment emancipation practices capable to overcome dominance relationships of social exclusion imposes an organic intellectual development which, with a critical and reflexive capacity and with the instrumentalization of the research-action approach contributes to the construction of an emancipation common sense and a conscious praxis towards local sustainability.

In that sense, the project was ruled by the socialization of scientific and technological knowledge and of sustainable productive practices, towards labor qualification the potentialization of knowledge and everyday experiences within the Social Technology perspective. Techniques, transforming methodologies and/or applied interaction with the population and the appropriate solutions posted by this very same population for social inclusion and improvement of life conditions. In this regard, Social Technology incorporates the existing technologies and creates new committed technologies within the singular interests of the several local social segments, with a focus on their demands, characteristics and potentials (Ritto, 2008). That approach integrates: (1) academic and traditional forms of knowledge with the actors' participation involved in the research process and in teaching approaches with a views to promoting human, social, environmental, cultural and economic development, when nearing social demands of knowledge production; (2) it inverts subject's traditional role as a passive agent of public policies to make them become central actors of the construction process towards developing conditions for a sustainable human development; (3) it assumes the unification of reality and the consequent specification and construction of solutions that affect communities respecting and valuing their history, culture and local knowledge inspired by their own principles, under the transdisciplinary view, and (4) it intends that initiatives and the proposed processes enable the development of other projects to contribute to the promotion of an effective social and environmental environmental.

Therefore, the activities of Environmental Education developed in the region within the project intended to enlarge critical awareness in social actors to qualify them to problematize reality and assume their social responsibility that, as seen by Gramsci (1985), represents the organic intellectuals construction - individuals prepared to assume their role as the mediators of diverse interests of social groups, acting on and managing public policies. We understand that to exercise such a role, it is necessary that those individuals be endowed with diagnosis capacity, of initiative to face decision-making processes to solve problems, teamwork, organization capacity to face uncertain situations to help establish better shared decision-making. Such competences make possible that the actions of the communities' mobilization, of the spread of information and of enlargement of ecological awareness may contribute to a general increase in awareness and participation, making the whole process coherent, structured and emancipating. Boaventura de Souza Santos (2000:329-342), in his turn,, notices that the qualitative improvement of the common sense concerning scientific knowledge characterizes the epistemological rupture of modern science, which will be more important in post-modern science if scientific knowledge feeds common sense. He understands that common sense:

- in spite of being conservative, has a utopian dimension and freedom that may be enlarged through the dialogue with scientific knowledge;
- for being practical and pragmatic, reproduces agglutinated life experiences of a dying social group;
- for being transparent and evident, distrusts the opacity of technological objectives;
- for being superficial when concerning structures that are form awareness, it is foremost in capturing the horizontal depth of conscious relationships between people and things;
- for being to demoralizing and non-methodic, it reproduces itself spontaneously in everyday life;
- for accepting what exists just as it exists, it privileges action that does not produce significant ruptures in Reality.

Based on those definitions, Boaventura proposes a new emancipation common sense that comes from an emancipation knowledge, a form of knowledge that departs from an ignorance standpoint designated by colonialism (the other as an object) towards a point where knowledge is designated as solidarity (the other as a subject) (2000: 29). Emancipation knowledge is solemnity-reflexive as it "knows that is not through theory that theory itself becomes common sense. The theory (2000, 37) is the cartographic awareness of a pathway on which political, social and cultural fights pass on, influencing and being influenced by them".

The educational practice of an inspired Environmental Education proposes the construction of the ecological subject (Carvalho, 2004: 156-7). In that construction movement the subject responsible for committed action-taking with sustainable and social fairness is a dynamic that integrates the dialectic method in its logic to interpret and act in the world to transform it (Marx and Engels, 1984: 111). As that historical methodology, the ideas and the thoughts reflect the material conditions of the human existence, being therefore indispensable to understand the concrete conditions of human life, as seen in time and history so that they can teach and implement pedagogical initiatives that result in emancipation and citizenship.

### **3.1. METHODOLOGY: CONCEPTUALIZATION AND APPLICATION**

As a result of our examination of the researches accomplished in the area of the Medium Paraíba do Sul, especially in the hydrographic basin of the Rio Preto, and before the multidimensionality of factors faced in the local reality, we understood the method as a pathway that is not devoid of safe ideas and absolute and unalterable knowledge, but it creates and is recreated without pre-defined goals beforehand, assuming the conquests of the a suspicion philosophy, present in the Socratic Method, in Montaigne's doubt, in Pascas proposall and in science with conscience by Morin, in other words, in a learning and re-learning process.

We also see the method as a strategy that contains of a group of beginnings that configure a guide for to think compound on two levels that pronounce and if retro-feeding - one that facilitates the development of strategies for the knowledge and another that facilitates the development of strategies for the action (Morin et al., 2007: 20-39).

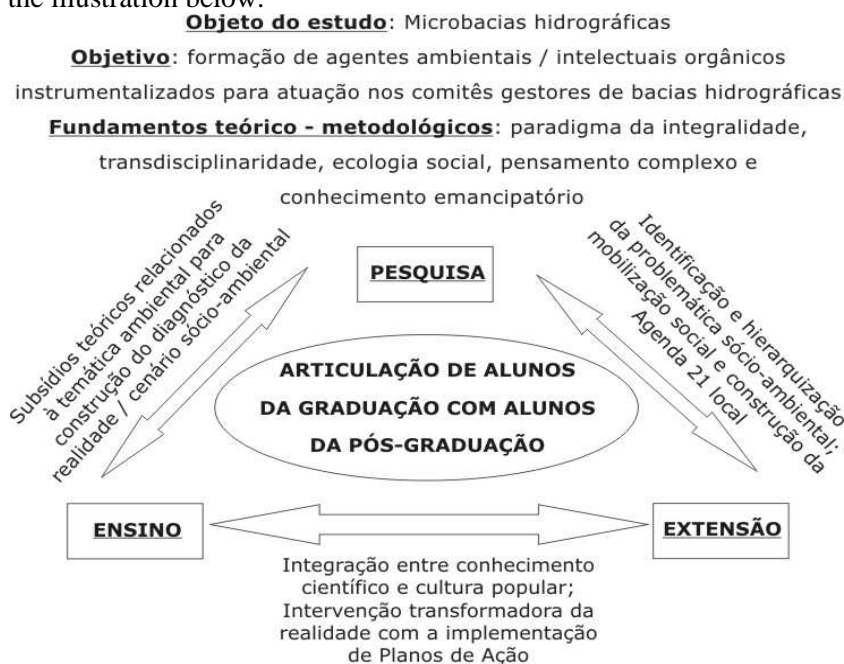
In relation to the knowledge production, a challenge to be faced by the researcher consists of cleaning his/her glance, impregnated of values, ideologies and prejudices that influence his/her perception of the reality, and to turn it open for the aspects of the landscape that they are not summarized to the physical middle, but they articulate the natural way and the cultural, assuming the human being's presence that, through researches productive practice, it transforms, at the same time, the environment and to their selves.

That select glance is characterized by incorporating the complex focus, that respects the echo-organization and it identifies the outline of the natural / cultural reality, to the researcher's perception and his/her task of overcoming the glance to discipline. With him, a change of glances can be established with the individuals that live and they work in the researched scenery, therefore to the objective data of reality the local social representation is incorporated, stained of elements of the imaginary and of the symbols of the experience of the community's life.

In relation to the development of the strategies for the action, when the change of glances with the community presupposes the institutionalization of a permanent community project that it opens possibilities for the individuals' emancipation and of the institutions in their interactions in the civil society, a work of community mobilization sends to the development of four methodological axes of diagnosis, performance and evaluation - the political-social organization, the maintainable production, the educational processes and the demand for integrated actions - that, pass through the fifth axis, the cultural, they guarantee the operation of the community life in an ascending spiral movement non-linear. Such axes, proposed in the Methodology for the collective mobilization and individual Met-MOCI (Falcão / Andrade) were incorporate, in that project, to the stages of the methodology Research-action that are constituted by an exploratory phase and of elaboration of the pre-project - formulation of the problem, construction of the scenery and of the diagnosis social/environmental (stage I); for the elaboration of the project (stage II); for a social mobilization and analysis of the problems and of the necessary actions to solve them (stage III) and for the elaboration of the Plan of Action, whose authorship is shared by the social subjects involved in the research-action (stage IV) process. The Plan of Action is characterized by being pedagogic instrument that it involves the subjects in community meetings making possible the debate about the local problem, the planning and the construction of the Plan, and for promoting an articulation among the production of the scientific knowledge, the research of the scenery social/environmental and the intervention in the reality, starting from the social demands and of the community mobilization.

The research-action, methodological strategy adopted for conception, elaboration and implementation of Plans of Action, it emphasizes the diffusion of information and of guidelines for formation of leaderships, with views to the incentive of new pedagogic actions and the support to the

integrated actions developed by the several communities around the enterprises and of the activities partner-economical-political-environmental. The knowledge and practices join in the interventions as schematized in the illustration below.



The projects, for their time, are developed committed with academic excellence beside the commitment with the effective presentation of results through the intervention in real problems. In that perspective, it incorporates: (a) the attributes of the “glocalization” that the researches and the interventions consider the characteristics of the place. culture, opportunities and embarrassments. beside the global dynamics and of their influences, positive and negative, in the direction of recommendations and of proposed of knowledge formalization and of action gone back to the maintainable human development; (b) the perspective Multi-actor in that the knowledge, the experiences and the needs emerge of the social partners' group that if define their selves in the real spaces of performance and they propitiate, to every moment, the configuration of the real and (c) the movement of Social Technology, already mentioned previously, whose systematic efforts already feel in the sense of enlarging the borders of the application of the knowledge available for the improvement of the quality of life of social segments excluded by the actions of the market, respecting them know no-scientific of each community.

It is important to emphasize the implication of the methodologies Met-MOCI and research-action happened without there was, however, a lineal relationship among the phases presented by each one of them. That articulation was made in an attempt to give bill of inventorying the problem inherent social/environmental to the places object of that study, of acting starting from the priorities listed for the social actors and of evaluating the implemented activities, tends in view the need to establish a more agile methodological flow than it articulated mobilization actions to the education formative actions of the which result innovative productive practices.

For constituting as a line of the social research that supplies the efficient ways so that participants' groups and of researchers they formulate guidelines transformers, the Research-action (Morin, 2004) allows the articulation with a methodology that enlarges the bases of the community mobilization seeking to promote a planned action of character social, education or technician. The recognition of the possibility of that articulation links to the perception that the three important phases that precede the stage of elaboration of the Plan of Action are combined with the axes of the methodology Met-MOCI, although that methodology extends their tentacles when presenting an axis related to the maintainable production and to configure the cultural axis as traverse articulator of the other ones four.

The articulation of the Research-action with the methodology Met-MOCI was made in the attempt to render the goals proposed in the project, given the short time and the difficulties faced to

touch and to contain the people, mainly the small producers, whose great distances among the properties, the precariousness of the highways and the difficulties faced in the daily work, per times, it put barrier the wills and they conform the conformism. In that perspective, the adaptation of the stages of the Research-action to the axes of Met-MOCI allowed that, after the exploratory phase and the visualization of the landscape, in the scenery built starting from the diagnosis accomplished with more than ninety families in different moments of meetings, parties, masses, visit-techniques, interviews, informal conversations, discussions and analyses, the problems social/environmental and their contradictions were revealed, and sketched some proposed to face them. With base in that diagnosis, activities were planned for spread of information, accomplished workshops, complemented by Seminars about Environmental Education. The approached themes and the actions of production of preserves of fruits and of vegetables (compotes and pickles) and the identification of the medicinal herbs cultivated by people in their home-made vegetable gardens. they woke up the interest for the educational process that it appears for an articulation of the traditional knowledge to the scientific knowledge, with views to produce in a maintainable way, joining value to the agricultural (fruits and vegetables) products, and to motivate the cultivation of medicinal and aromatic herbs that, properly processed for use in teas, sachets and dyes, they will do not depend on immediate commercialization to generate income.

Changing those axes for the concrete actions accomplished in the basin hydrographic of the Rio Preto, in the extent of this project, and in the perspective of thinking elements to build new Methodological Alternatives in Atmosphere and Society, the reflection / action based in the two methodologies and the analysis of the concrete conditions of the reality fomented the registration of a new strategy of community mobilization that it appears of a collective action of common interest, which is, of the implementation of productive practices that they join value to the existent products in the places. Such action works as appeal to the participation and the solidarity commitment. The answer obtained with the mobilization around the proposal of socialization of information and of techniques for development of maintainable productive practices, that correspond to the people's immediate interest of joining value and of generating income starting from the transformation of the products that they present difficulties for commercialization in nature, it demonstrated the concrete possibility of the social actors' of that basin hydrographic participation in collective projects and in interactive nets and it appeared for the overcoming of the conformism. In the same way, the process of construction of the inventory of the medicinal herbs cultivated in the producing small women's home-made vegetable gardens, elaborated starting from the interviews done in loco, it woke up them for the possibility of they be turned active economically and of they have access to the public politics. Like this being, to the actions undertaken in this project with base in the Research-action and in Met-MOCI they were incorporate some proposed thought by Neffa&Ritto that enlarge the theoretical-practical field when suggesting:

1. Construction of inventory of the problem social/environmental and of the local potentialities that allow the visualization of the landscape built with base in the diagnosis participative. Meetings of articulations, of reflection and of discussions they reveal the problem social/environmental, they allow the hierarchy of the problems and they point the themes of the communities' interest that, for they be specific, they generate demands for differentiated educational processes, and they lead off the informal educational process;
2. Articulations, reflections and discussions in meetings that point the problem social/environmental, allow the hierarchy of the problems and identify the themes of the communities' interest that, for they be specific, they generate demands for differentiated educational processes, leading off the informal educational process and the socialization of new knowledge about the education, the health, the work and the environment;
3. Seduction for community mobilization and for insert in the formative processes, starting from generating (Paulo Freire) themes of the local social actors' political-economical-environmental interest, through moments productive people who can be courses, lectures, workshops, reforestation collective efforts, applications of kits for analyses of the waters of the rivers, among others;
4. Organic (Gramsci) intellectuals' formation - individuals prepared to assume the paper of mediators among the interests of the social groups where they act and the one of the managers of public politics - for us to contribute in the planning participative, with views to look for solutions for the

- community's demands saw projects, programs and actions transformers to promote social inclusion, respecting the environment and the local cultures;
5. Exchange of you know and practices social/environmental as subsidy to the appearance of the sense common emancipation (Santos) and the incorporation of maintainable productive practices;
  6. Deeping of the interactive dimensions, through nets and of associations that articulate the social actors, with views to exchange know traditional and experiences, to identify potentialities, to deepen technician-scientific knowledge and to consolidate the practices that qualify for the work, with views to enlarge the fan of the integrated actions of human promotion.

People fit to highlight that, for analysis of the cultural subjects, she opted for the (Bogdan & Biklen, 1994:60) ethnography because that methodology comes as an approach that "refers to the study in the way as the individuals build and they understand their daily lives". In that perspective, the study of the social representation used some traditionally instruments linked to the ethnography, as the participant observation and the interview not structured. It is important to accentuate that, in this study, also pictures were used, in way to support the understanding of the contexts in that the subject of the investigation locate.

Among the actions developed in the perspective of forming the ecological subject stand out the visit-techniques, the countless meetings and the seminars accomplished at the schools of the public net where lectures were promoted on administration of basins hydrographic and analyzed the concepts of maintainable local development, agro ecology, associations and cooperatives, solid residues and maintainable consumption, as well as, exhibited videos on the problem social/environmental and implemented jewelry workshops using woven and paper and of bottles pets for production of toys, brooms and other objects.

The improvement workshops and home-made industrialization of foods, supplied by a former-technique of EMATER / RJ in the places of Chalet, Alberto Furtado, Stop of Crowns, Parapeúna and Paiolino for seventy three people, most women and some few men's young accompanied girls and boys, they allowed the socialization of techniques of sterilization of glasses, of conservation of vegetables without chemistry use for pickles production and for making of compotes of orange candies, papaya, banana and pumpkin in pieces, beet jellies, mulberry, banana with orange and papaya with pineapple. They allowed, also, the learning of the making of yam coconut sweet. The craft workshops prioritized the social orientation of the feminine work for use of available resources in the area where you/they live (seeds, grains) and of scraps of fabrics came from of the local textile companies, aiming at the production of panels, quilts and decorations of Christmas, among other objects susceptible to commercialization, that so much can promote generation of income as elevation of the women's self-esteem involved in the project.

As for the medicinal and aromatic herbs, the identification of its cultivation in the small domestic vegetable gardens made possible that a listing that identify was accomplished the corresponding scientific names, the uses that the residents of the basin hydrographic of the Rio Preto do of them appearing, with base in the common sense, and the therapeutic properties of those plants. The identification of the readiness of the small producers appeared for the viability of the enlargement of that production with base in feminine labor as one in the ways of doing the articulation among you know them traditional and the scientific ones, of incorporating new techniques and of transforming the scientific knowledge in a new sense common emancipate.

By Boaventura de Souza Santos, "the knowledge emancipation, to the turn-being common sense, doesn't despise the knowledge that produces technology, but he/she understands that just as the knowledge it should be translated in solemnity-knowledge, the technological development should be translated in life" wisdom (2000: 109).

## CONCLUSION

The socioeconomic transformations of the last 20 years affected the behavior of companies deeply until then just gone back to maximization of the profit. As consequence of the largest pressure for transparency in the businesses, the companies started to adopt a more responsible posture in their actions. In that context, they emerge the solidary practices that conspire in the sense of to get better and to turn more productive the established relationships among the agents involved in the enterprises. The Methodology grows leaning in an administration participative of the Projects (research-action), from the discussions of the proposals to the effective interventions, with views to the socialization of

scientific and technological knowledge and of maintainable productive practices considering all of the involved agents. In that sense, it intends to encourage the development of a net of subjects, people and organizations, committed with the development political, economical and social, above all with the reduction of the inequality. The adopted methodologies will be sustained always in the articulation of scientific knowledge with you know places, through practices social/environmental related to the work generation and income, to the health, to the education and the sustainability.

In certain measure, the objective of the transdisciplinarity in the knowledge co-creation is to encourage a community of thinkers and to facilitate the generation of committed projects with the promotion of a culture that allows the articulation of the you know in function of the creation of an ethics of the solidarity sustained in the understanding of the diversity of the subjects that you/they look for the expressed unit in the collective action on behalf of the very common. Centered in the subject, the transdisciplinarity conspires in the direction of a more enlarged perception of the reality, with views to the creation and the use of knowledge in subjects and local circumstances; then the proposed methodology. A transdisciplinarity area wants to be an open space for fertile dialogue and fertilization crossed among researchers, teachers, artists, managers and social actors who want to open their approach of the reality second this semantic plurality. The projects transdisciplinarity, developed by a net of actors holders of specific knowledge that you/they are to discuss complex situations and in crossed fertilization of you know, teaching and learning continually with the group, they contribute to the enlargement of the perception of the reality and of the identification in more appropriate ways and roads promoters of progress in the context of the environmental sustainability.

## References

- BOGDAN & BIKLEN. 1994. *Investigação Qualitativa em Educação. Uma introdução à teoria e aos métodos*. Porto – Portugal: Porto Editora [Coleção Ciências da Educação].
- CALAZANS, Maria Julieta C., CASTRO, Elza Maria Neffa Vieira de., NOVICKI, Victor. *Agricultura familiar na região do Médio Paraíba do Sul in: Campo Aberto, o rural no estado do Rio de Janeiro/ (org) Maria José Carneiro et al. Rio de Janeiro: Contra Capa 1998, pp. 247-259.*
- CARVALHO, Isabel Cristina de Moura. 2004. *Educação Ambiental: a formação do sujeito ecológico*. São Paulo: Cortez.
- CASTORIADIS, C. 1987. *As encruzilhadas do labirinto, vol. II*, São Paulo: Paz e Terra.
- CIDE - Fundação Centro de Informações e Dados do Rio de Janeiro. *Anuário Estatístico do Estado do Rio de Janeiro 1999-2000*. Rio de Janeiro: Cide, 2000, p.421.
- FALCÃO, Emmanuel e ANDRADE, José Maria. 2002. *Metodologia para a Mobilização coletiva e individual*. João Pessoa: UFPE/ Editora Universitária/Agente.
- FREIRE, Paulo. 1997. *Pedagogia da autonomia: saberes necessários à prática educativa*. São Paulo: Paz e Terra.
- GRAMSCI, Antonio. 1985. *Os intelectuais e a organização da cultura*. Rio de Janeiro: Civilização Brasileira.
- ISER, Wolfgang. 1996. *O imaginário*. In: *O fictício e o imaginário – perspectiva de uma antropologia literária*. Rio de Janeiro: EdUERJ, pp. 209-302.
- IBGE (Instituto Brasileiro de Geografia e Estatística) *Censo Agropecuário 1995/1996*. Rio de Janeiro: IBGE, 1997.
- LAYRAGUES, P. P. 2004. *Para que a educação ambiental encontre a educação*. In: LOUREIRO, Carlos Frederico B. São Paulo: Cortez, pp. 11-18.
- MARX, K. & ENGELS, F. 1984. *A ideologia alemã. Teses sobre Feuerbach*. São Paulo: Editora Moraes.
- LUKÁCS, György. 2007. *Marx, ontología del ser social*. Ediciones Akal. Madrid.
- MÉSZÁROS, István. 2002. *Para além do Capital: rumo a uma teoria da transição*. São Paulo: Boitempo; Campinas: Editora da Unicamp.
- MORIN, André. 2004. *Pesquisa-ação integral e sistêmica: uma antropopedagogia renovada*. Rio de Janeiro: DP&A.
- MORIN, Edgar, CIURANA, Emílio Roger, MOTTA, Raul Domingo. 2007. *Educar na era planetária: o pensamento complexo como método de aprendizagem pelo erro e incerteza humana*. São Paulo: Cortez; Brasília, DF: UNESCO.
- NEFFA, Elza. 2001. *Desenvolvimento e Degradação Ambiental. Um estudo na região do Médio Paraíba do Sul*. Tese de Doutorado. Rio de Janeiro: CPDA/UFRRJ.
- NEFFA, Elza (coord.). 1992. *Vale do Rio Preto: Recursos e Necessidades*. Rio de Janeiro: Editora Valença.
- \_\_\_\_\_. (org.). 2008. *Relatório de Pesquisa “Saberes e práticas sócio-ambientais: ação integrada na bacia hidrográfica do rio Preto/região do Médio Paraíba do Sul”*. Rio de Janeiro: UERJ/FAPERJ.
- Prefeitura Municipal de Valença-RJ. *Plano Diretor Participativo. Lei Complementar n. 62, de 09 de outubro de 2007*.

NICOLESCU, Basarab. 1999. O manifesto da transdisciplinaridade. São Paulo: Trion.

THIOLLENT, Michel. 1986. Metodologia da Pesquisa-Ação, 3a ed., São Paulo: Cortez.

RITTO, Antônio Carlos de A. 2008. Projeto Centro de Referência em Responsabilidade Social e Desenvolvimento Sustentável. Rio de Janeiro, UERJ, (mimeo).

RTS – Rede de Tecnologia Social - [www.rts.org.br](http://www.rts.org.br).

SANTOS, Boaventura de Souza. 2000. A crítica da razão indolente contra o desperdício da experiência. São Paulo: Cortez.

\_\_\_\_\_. 2001. Um discurso sobre as ciências. Porto/Portugal. 12ª ed. Edições Afrontamento.

SANTOS, Milton. 2004. A Natureza do Espaço: técnica e tempo, razão e emoção. São Paulo: Editora da Universidade de São Paulo.