

ΣΟΦΙΑ-SOPHIA

Information research journal
Short title: Sophia
ISSN (electronic): 2346-0806
ISSN (printed): 1794-8932

Item
Date Received: January 08 2015
revised date: March 11 2015
Accepted: July 18 2015

Environmental education as a necessary strategy for planning new regional approaches in the Department of Meta*

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Abstract

The main purpose of the research is to analyze the evolution of environmental education processes in the State of Meta, Colombia, with emphasis on establishing strategies within the framework of sustainable development for planning new regional approaches, which may be easily reproducible in other sectors of the country. The methodological process was approached in two phases: the first one involves a review and bibliographic analysis of some instruments for territorial and environmental planning, considering regulations in effect on this matter. Then, a research was proposed under the method of case study, where local reality represented by Melua river basin is described and analyzed. Research techniques and instruments were applied to representative sample of the education community, participative diagnostics were produced, spatial analyses, interviews, speaking map, social cartography, comparison matrixes, SWOT analysis, mapping of institutional, public, private actors, and illegal groups. Among the main findings include challenges faced by rio Melua basin in terms of environmental political matters, associated to education ambit, synergic work by the actors, more institutional and state support, integration of strategies showing the need of incorporating the subject of environmental education, holistic basis in this territory, parting from government policies, care and conservation of eco-systemic resources, and finally, the need of creating citizen participation schemes, deeply related to the topic of identity and territorial appropriation. An integral analysis of the topic allowed to prepare a classification of the problems faced by such region, establish a network map of relationships among actors, and contribute on jointly basis to territorial construction parting from environmental education.

Key words: Educative community, sustainable development, environmental education, territorial planning instruments, environmental planning.

*This article comes from the Project Environmental Education Processes in the State of Meta, as a strategy for Sustainable Regional Development. The case of Melua river basin, in the municipality of Puerto Lopez, Meta, 2010-2012. Research group: Sustainable Development and Environment. Autonoma de Manizales University.

Introduction

Environmental research progress has considerably increased in Colombia; publication of the various planning instruments and public policies on this matter, have resulted from the crisis currently faced by the territories, represented in alarming figures of pollution, affectation to biodiversity, territorial and ecosystems fragility, and productive unsustainability, social disregarding, poverty, which is mainly the result of wrongly considering the territory, exclusively as soil, but not as a natural resource, scarce and non-renewable.

Environmental unbalance is not linked only to dimension of resources, but using and protecting is now a multi-dimension situation, of social complexity, and systemic character, derived from society-nature relationships. It is now indispensable to understand the territory as a strategic asset of a nation, since its management, and allocation of importance to the natural, landscaping and cultural, integrate a holistic vision toward a process of sustainable development.

Parting from the above considerations we must consider the need of managing, on articulated basis, environmental and territorial problems, presented with the education field, in order to advance toward sustainability of the various communities. This is an unpostponable task for the country; such work should initiate from the school, where students, teaches, and the education community in general, have to become active subjects of these processes, producing knowledge parting from their own habitat, recognizing strengths, and weaknesses, which lead to question ourselves about what territory we dream of, and of course make it come true.

Education plays a fundamental role in opening spaces for dialogue, social imaginaries to produce high level of awareness on the natural and cultural patrimony, preparing at the same time construction of social organizations to advance toward better territorial appropriation. Even though, from the education sector, inclusion of the environmental topic is process under construction, which calls for more legislation, political will and commitment by the various actors member of the territory, in order to allocate priority to this topic in the various agendas, development plans and organization plans, in which this work has just started to be included as a priority matter.

It is worth to recognized that some aspects on this matter have dealt with; however, it may not be stated that existence of instruments on environmental education, reveal current reality of the institutions, and are the solution for environmental problems; their greatest difficulty is how they have been assumed – simply as an institutional obligation, but not as a commitment in which human welfare is at stake.

Under this context environmental education is regarded as current strategy on how to approach the environmental problem, beyond only planning just technical or technological proposals; which is projected today is a more integrating approach, which leads to contextualize the new environmental problems as key aspects of sustainable development at local scope, and reflect its critical dimension, contemporary ways in which relationships among actors, factors and socio-territorials are expressed within a context of crisis of the global model of development (Leff 2004). Education is the one called to initiate and strengthen such processes, a hard work calling for creation of solid platforms of governability and citizen participation.

Parting from such considerations, this study was performed between 2010-2012 in the basin of Melua river, which is located north center of the Department of Meta, and to the southwestern of the municipality of Puerto Lopez. This geographic area as special features, a combination of natural resources wealth, and at the same time, a low environmental conscience in front of such patrimony, low local capability of human capital to create identity from the hydric resource; there are low levels of social capital to build synergy, and a great difficulty to work on common objectives, in order to meet community expectations, and become capable of causing positive impact on environmental quality in the region.

The purpose of this work was to show the status of environmental education in the Department of Meta, which is not different from other regions of the country, where large companies of energy sector are present; this part of the economy produces for this area an explicit wealth of more than 245.500 million CO pesos in royalties (SIID, 2009); therefore, the research shows the political, social, environmental and economic system, which reflects the contribution made by such companies to the region, impact and challenges faced in front of this topic.

In turn, the research held a clearer interest from the pedagogic scope, to create spaces for dialogue, reflection and interaction, promote awareness in front of the responsibility of contributing to sustainability of local management, and advancement toward an endogenous sustainable development, parting from the two most important resources: its inhabitants and the natural patrimony.

Materials and methods

The methodological was within the research in social studies, which approaches man problems with environment, leading to a direct approach to the social reality, when dealing with a problem with human groups in a specific territory, where subjects interact and transform such environment. (Abello, 2009).

The type of research was mainly qualitative, since it tried to identify the features of such situation evidenced in the basin of Melua river, which in this case, deals with absence of environmental education at education institutions, which factor is directly associated to a series of variables, including low environmental conscience, low local capability, lack of rooting and lack of human and social capital formation.

Descriptive: Regarding the intention of describing the characteristics of the phenomenon.

Explanatory: Recognition of such problems, their analysis, and reflections produce this type of approach, since the purpose was investigation and subsequent evaluation of the impact caused by this process.

It was a case study, which allowed to investigate more deeply than through studies, parting from a contemporary phenomenon, which in addition requires a deep analysis, in order to plan larger and more detailed researches, as well as validate research methodologies and tools.

The research was approached from systemic approach which led to establish inter-agency relationships within the various subsystems, a holistic approach that showed social, economic, environmental and political dimensions of the problem.

Social critical: The research pointed a creating auto-reflective conscience by inhabitants on environment, participation of researching practice in teaching at the classroom, parting from observation of the surrounding, training on topics associated to

environmental education, recognition of strengths and weaknesses, of such territory, and dialogue with actors which creates a relationship between theory and practice.

The project involved both public actors and private: 13 teachers, 193 students, parents, farmers, community leaders, and the community in general, selected taking into account needs of the region. The following are the techniques and instruments involved along the research:

Technical	Instruments
Participant observation	Guide of the tour
Participative diagnostics	Territorial fast evaluation
Conversatories	Rain of ideas, workshops
Open interviews	Technical cartography, GPS, images
Spatial analysis	Socio-territorial maps
DOFA matrix	Diagnostic, tree of problems
Matrixes of mathematic relationship	Design and optimization of a model

Results and discussion

It is necessary to explain, in the light of this study, that classroom processes increasingly show more difficulties, which get worse regarding to environmental education; from the curricular ambit, its incorporation has not been a transversal axle in the education system of the Country, notwithstanding, and as stated along the researching exercise there have been many efforts, but perhaps not sufficient, and overall not proper to empower it from such design, results from an integral vision, show little progress that does not meet, or get close to the reality undergone by education communities.

From this perspective, it is not groundless to claim that environmental education is among the great challenges of the country, which needs to become a part of a very strong renewal of education in general; its results are currently linked to compliance with general legislative regulations; even though, its integration lacks of high impact strategies, which show results at the classroom, that promote formation strategies, and show concrete actions. A process of interaction should be created, in such a manner that meaning and goals of the school community as a whole are transformed, and at the same extent, the environmental matter also make clear what purposes are to be pursued through diffusion at the school.

Supported on the above, it is obvious that the work of environmental education, since its historical construction, has shown a strong influence by

ideologies such as ecology, activism, pacifism at all costs, which posture have greatly affected postponement of deep solutions, really needed in this field of knowledge, preference should be given to the Decennial Plan of Education, which among other things provide that “the third challenge is related to construction and application of sustainable development models, with solid and productive economies, in social and economic terms, competitive and in balance with environment” (MEN, 2006).

Under this context, in analyzing education processes on the Department of Meta, it was necessary review and bibliographic analysis of various documents and instruments of territorial planning, understood as the navigation chart of any territory (PND, 2010). Results show that its structure is in synchrony with these topics; it is unquestionable to see that education is not limited just to classroom work, topics such as decentralization, understood as the process which seeks improvement of productivity and efficiency in provision of social services, are already explicit for education in Law 715, 2001.

Parting from such consideration, at a first time it was necessary to present, in a general manner, results from evaluation between the education plan of the Department of Meta and government and state policies contained in the Sectorial Plan 2006-2010, and the Decennial Plan of Education, taking environmental education as the central reference.

The same plan supports, through data and statistical analysis, the articulation of the education Plan of the Department of Meta with the Sectorial Plan “United the Meta Wins” and the Decennial Education Plan, by evaluating the articulation level of the plan, the articulation level parting from the correspondence, and finally the level of articulation quality, it is possible to conclude that there is a promising education panorama for this region. Chart 1 summarizes the most relevant percentages of these three aspects:

Table 1. Articulation level of education plan of the Department of Meta with the Sectorial Plan.

Education level	Axle of policy	Articulation					
		Correspondence (NCA)		Quality (NCA)		Articulation level of the Plan (NAP).	
		%	Level	%	Level	%	Level
Initial education	Coverage	67%	Middle	63%	Middle	64%	Middle
Preschool, basic and middle.	Quality	67%	Middle	60%	Middle	63%	Middle
	Pertinence	100%	High	50%	Middle	70%	Middle
	Efficiency	100%	High	100%	High	100%	High
	Subtotal	78%	High	65%	Middle	70%	Middle
Educación superior	Coverage	50%	Middle	40%	Bajo	40%	Middle
	Quality and Pertinence	75%	High	27%	Bajo	46%	Middle
	Subtotal	67%	Middle	31%	Bajo	45%	Middle
Total		77%	High	62%	Middle	68%	Middle

Source: Department Development Plan 2008-2011 “United Meta Wins”.

It is strongly highlighted the correspondence level associated to proper statement within plans of Development Objective for the Millenium (UN, 2013), and vision 2019, as well as the education role in the society by approaching its contribution from the various dimensions: social, economic, and institutional. However, in environmental terms, policies provided in these instruments lack of a clear definition of strategic objectives and sub-programs related to environmental education for the Department of Meta.

In addition, to evaluate the instruments involving environmental education for the Department of Meta, it is important make an outline about their functions, at legislative level, vision and objectives, Committee for Environmental Education –CIDEA, Municipal Environmental Committee- CAM, Citizen Project of Environmental Education –PROCEDA, School Environmental Projects –PRAE (for their Spanish abbreviation).

Parting from a general characterization of these four environmental planning instruments, it is clear that their vision and objectives are applicable for the whole national territory, and their usefulness and applicability, include various action lines, which are proposed according to needs of the region, for the specific case of Meta, it has been important the support by technical committees of environmental education, bearing in mind that during the last years, a major economic and technical support has been implemented, seeking a major articulation and coordination.

Parting from the bibliographic review, it is possible to evidence that this instrument plays a key role for the Department of Meta regarding to environmental education, by performing various activities related to environmental problems, training teachers and environmental promoters in the region, and consolidating PRAE and PROCEDAS network (CIDEA, 2008).

Notwithstanding, considering the dimension of its various projects, its effectiveness is questionable, since they have been tried to be implanted in absence of a coordinated regions vision which ensures their effectiveness, as it has happened to the other instruments, where there is incapacity to effectively integrate all ecosystem, social, economic, cultural and political realities. Such instruments show a general unbalance of diagnostic and mechanisms proposed to achieve goals, orient solutions, or effectively apply real strategies.

The CAMs, for example, although historically have performed a core role regarding ecological potential of this region, their actions have not been represented by a true environmental organization, which leads the Department to perform serious processes of education, protection, management, and much less, comply with laws in effect on this matter, in order to perform processes that enable the municipalities to involve the various actors of the municipal reality (CEA, 2008).

According to documental review, the CAMs have been in a process of standstill; the various actions by the environmental management of the Department have sought their reactivation through concrete actions, such as an approach to the community in order to learn the functions of such instrument, and even tasks such as recycling, celebration of the Day of the Water, proposals given by the same community, organization of meetings with the various institutional entities involved in the municipalities, promotion of awareness through conferences related to environmental problems, training the community, specially the education one, on topics such as environmental laws and regulations, “environmental fines”, training on illegal trafficking of fauna and flora, illegal mining, on biodiversity, and on the Municipal Environmental Management System – SISGAM (Spanish abbreviation), accompanied by the Corporation for Sustainable Development of La Macarena Special Management Area – CORPOMACARENA, 2007).

Even though, such actions do not transcend, perhaps there is any will by the various actors, who see in the region new and great opportunities, but absence of a serious commitment by actors, and the fact that there is no institutional capacity as necessary to carry out clear projects and programs regarding environmental education, as shown by Table 2, through a DOFA analysis.

Table 2: DOFA analysis by the Municipal Environmental Committee.

Weaknesses	Opportunities
Ignorance about environmental law.	Current administration has understood the importance of the CAM
Historically municipal administrations have not considered environment as an important matter, therefore they lack of basis to work on the same.	There is a great support by institutions such as the environmental management office.
Lack of Budget for realization of environmental activities.	There are various social groups and institutions, at the municipalities, that work for environment preservation.
Lack of information in order to perform procedures before external entities.	Colombia has sufficient environmental law.
Absence of a visible environmental authority in the municipalities.	The municipality has a great environment potential.
Strengths	Continous Improving
Members of the CAM are interested in environment.	Little interest by inhabitants of the municipalities in environmental matters.
In the municipality there are entities and organizations, which have worked for environment on separated basis, and the committee is the proper scenario to unit all of these efforts.	Illegal exploitation, (sawmills, mining), which cause a great environmental impact.
	Low citizen interest and identity regarding natural resources in the various municipalities.
CAM organization has involved various actors of the territories in the environmental framework.	

Source. Own preparation, parting from the report by the Inter-institutional Technical Committee of Environmental Education in the Department of Meta (2008).

Considering the above aspects, the role played by the CAM as an environmental instrument is very important in terms of human capital strengthening, taking into account the direct approach through projects which involve the community in general; however, its actions toward resolution of so local problems, limits it and prevents its action to involve other areas.

In turn, school environmental projects in the Department, show an alarming situation, when establishing the great role they play in local and regional of territory environmental diagnostics, (Rivarosa, 2004), it not just an instrument designed for education institutions, all of the other instruments available on environmental education are directly related to this instrument.

Regarding the topic, it is important to mention that this instrument becomes more important for the Department parting from consolidation of the Environmental Department System: “Defined as the group of orientations, standards, activities, resources, programs and institutions that lead to execution of environmental management in the Department of Meta.” It is from there, that a diagnostic is realized on preparation and implementation of school environmental projects in the Department, yielding concerning results, through which the Environmental Management Office and Cormacarena, proposed to establish as a strategic line of action, recuperation and conservation of basins and micro-basins through implementation of the PRAE.

Since 2003, supported by Law 812, Cormacarena as an environmental entity, begins to operate in the whole Department of Meta, in search of consolidating one single environmental authority, capable of meeting and attending the great environmental challenges of the territory (PDD, 2008); notwithstanding, its actions have not impacted the territory; although execution of projects as an autonomous corporation of the region reveal achievement of activities on environmental education, such activities have not transcended beyond activism on the topic.

Therefore, considering current situation of processes in such instruments, it is obvious that proposed objectives, most of them do not meet constant transformations of the territory; in addition, their actions do not show a clear commitment regarding the problem, where it is open inferred the lack of coordination of social actors and institutions, productive sectors, little use of natural resources, and even more, on strengthening alternatives to empower what environment provides.

By stating the above, it is observed that the main failures on environmental education for the Department of Meta come from the political action, where standards established for this purpose within the National Policy of Environmental Education are not complied with, because of absence of a proper administrative organization of the State, which leads to disorganization and incapacity of public agencies to approach such problems; this situation is visible not only in the Department of Meta, but it is generalized nationwide.

Although there are some effort to create and enforce strategies aimed at improving environmental education, it is obvious that those in charge have

worked on insulated basis, they have not developed control methods to verify their compliance, proper and accurate performance of the system, and their responsibilities, which shows that instruments created from environmental education have involved poor systems for evaluation, tracking and monitoring. The above leads us to infer a lack of a proper process to measure the impact on this topic, strategies to be implemented in the various plans and documents are hardly known, but not how they have been done.

The attempt made by the Department of Meta shows some foundations related to tracking environmental education processes by some institutions, linked specially to the Inter-institutional Technical Committee; even though, it is concerning to see how the PRAE are ignored, turning into classroom activism, prepared to provide temporary solutions to needs of the region, among the most common, waste collection, solid residuals; if most regions show similar situations regarding environmental problems, who not to act on jointly basis?

Within this dynamics it is worth to mention, for example, economic and social features of a Department like Meta, this Department has the largest agricultural areas of the country, and explicit wealth in non-renewable resources, such as hydrocarbons, which contribute a large amount of royalties, this advantage, seen from many scenarios, should contribute to improved conditions for the population, but, paradoxically, this is a region undermined by various problems:

Not only because the first experiences of paramilitary organizations were experienced within its territory, and because the historical and traditional zone of FARC guerrilla is in its land, but because diverse and complex problems such as narc-traffic, concentration of land, and natural and ecological wealth marked and mark development of this conflict (Guzman, 2009).

These factors unchain demographic changes due to constant migration and serious modifications to social structures, associated to unfair distribution of the land, destruction of harvests and soils, implementation of new production systems, such as illegal crops, which aspects account not only for economic loss, but also create new ways of living, culture, identity, and worsen the political dimension (Guzman, 2009).

Not understanding the importance of these processes is denying that effectively the armed conflict have directly impacted the state of environmental policies in the Department, mainly in the rural sector, and that its sequels are lasting in the time.

Therefore it is indispensable, for environmental education to start from a holistic view to the territory, taking into account all dimensions of development, which results in a different orientation, in order to articulate local realities, to advance toward a state of different social policy in the region, where a model of environmental education is really implemented, based on common welfare, and therefore, on local and regional sustainable development, under which the foundations to change paradigms on environmental education are laid.

Upon a review to projects under execution by the Government of Meta, it is seen that most of these projects are governed by actions which promote recuperation of strategic ecosystems, searching actions to relief situations such as deforestation, loss of biodiversity, and mainly, recuperation of hydric resource.

One of the great failures currently faced by the Department of Meta, is absence of a decennial plan of education to govern, under clear directions projects that will be implemented, if there are legal means to make them possible, which are included in the Policy for Environmental Education. Organization of such plan strengthens identity processes, since the part from taking into account the potential of landscaping patrimony, and human capital formed and specialized on environmental matters, which leads to define concrete lines of action.

Findings stated so far on environmental education for the Department of Meta are clear, parting from the stated methodological process. In addition, there are various strategies resulting from the research, and which led to improve the level of local capability, and at the same time, to set the basis to consolidate proposals in front of the process of environmental education in this area of study, and in this manner to provide sustainability to the process; within such proposals it becomes very important the categorization of problems shown in table 3, which results from application of the various methodological strategies along development of the research, parting from axes that the education community consider as most relevant to deal with in order to promote improvement.

Table 3. Categorization of problems in the basin of Melua River

Criteria	Alternatives			
	Political	Environmental	Social	Economic
Governability	A1	A2	A3	A4
Environmental Management	B1	B2	B3	B4
Social Responsibility	C1	C2	C3	C4
Environmental Education	D1	D2	D3	D4

Source: Own preparation

Where:

A1= Lack of commitment and territorial presence by public institutions exercising influence on the basin

B1= Absence of projects and actions which promote environmental education processes in the basin

C1= Lack of synergic work to promote actions for conservation of natural resources in the area.

D1= Little institutional presence for environmental management

A2= Deterioration and disappearance of forests and strategic ecosystems in the zone

B2= Pollution of hydric sources in the zone, mainly in Melua river basin

C2= High degradation of soils resulting from agricultural practices

D2= Pollution of resources through hydrocarbons exploitation

A3= Absence of planning and organization of hydrographic basins

B3= Absence of environmental school projects at education institutions at the zone

C3= Lack of projects involving the community to train individuals on environment and development matters.

D3= Lack of planning hydrographic basins

A4= Economic benefit in exploitation of natural resources is assigned priority over protection and recuperation of ecosystems.

B4= Lack of projects involving the great touristic potential

C4= Absence of agro-ecologic which leads to produce economic growth, but simultaneously sustainable development. Public policies.

D4= There is a high economic growth, but social inequality and poverty, benefit redistribution.

After a general and particular bibliographic review of the municipality of Puerto Lopez, relevant actors for the research were identified, through additional support by key informants, such as directors and teachers of schools located in the basin, the Secretary of Education and Cormacarena. It is clear that environmental education processes should include many types of actors, both public and private, as well as various territorial levels or scales, but real absence of a consolidated process on this matter, both for the municipality and the Department of Meta, made it even more difficult identification of the pertinent actors.

Table 4. Characterization of actors in Melua river basin

Actor	Type of actor	Role	Territorial level	Importance for the process	Influence on the process
Puerto Lopez Mayor's Office	Public	To govern and define local development policies, including education	Local	High	Low
UMATA	Public	Technical assistance and environment	Local	Muy High	Low
Students of Melua river basin	Comunidad	School students	Local	Muy High	Moderate
Teachers of Melua river basin	Public	School teachers	Local	Very High	Moderate
VETRA	Private	Exploitation of hydrocarbons in the area	Local	Moderate	High
Society of cattle breeders of the municipality	Private	Cattle breeding	Local	Moderate	Low
Municipal Secretary of Education	Public	Education policies. Tracking and control	Local	Very High	Low
Directos Melua river basin	Public	School principals	Local	Very High	Moderate
Municipal Council	Public	Policies, standards, Project proposals	Local	High	Low
Environmental Policy	Public	Environmental education and control	Local	High	Low
Community action Board	Community	Social organization to improve life quality	Local	Moderate	Low
NGOs	NGOs	Environmengal groups, and activists	Local	High	Low
Other agricultural production companies	Private	Extraction of raw materials	Local	Moderate	Low
Parents of Melua river basin	Community	Students' sponsors	Local	Very High	Low
SENA	Public	Technological education	Regional	High	Low
Universities of the region	Public / Private	Higher education	Regional	High	Low
Government of Meta	Public	To govern and define State development policies, including education	Regional	Moderate	Low
CORMACARENA	Public	Protection, conservation and environmental education policies. Environmental authority	Regional	Very High	Low
State Secretary of Education	Public	Education policies. Tracking and control	Regional	High	Low
CIDEAM	Public	Define programs and projects of State environmental education.	Regional	Very High	Low
Ministry of National Education	Public	National policies, tracking and control	Nacional	Very High	Moderate

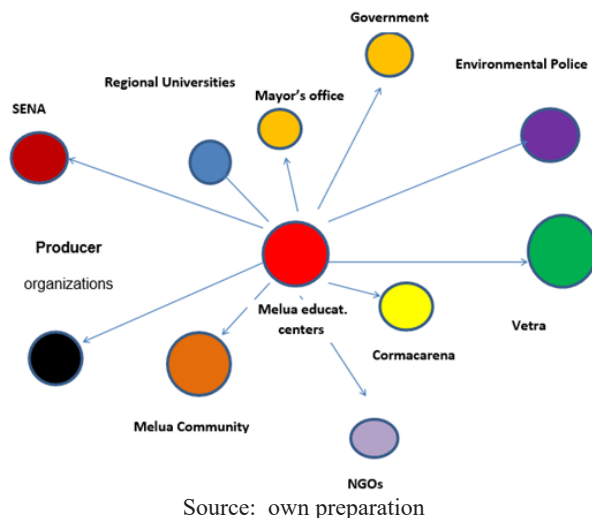
Source. Own preparation

The following matrix represents a basic characterization of actors who influence of may impact environmental education in the basin of Melua river. These actors have been grouped into three categories: 1: by type of actor. 2. By territorial level where they act, and 3. By the role they should play on the topic, that is, their functions. In addition, two columns in the matrix are presented, to classify them according to importance believed for each actor on the topic, and finally, their current real influence on environmental education process in the basin of Melua river.

Qualitative classification of importance and influence of actors on environmental education processes in the basin, shown in table 4, is carried out based on revised secondary information, field work, and final perception of the researchers.

According to the above table, we may conclude that actors holding either high or very high importance on environmental education processes for the basin, do not exercise the influence the should do, unlikely, some actors, such as VETRA, which may hold moderate or low importance on the topic, either because it is out of their functions or activities, or transitory basis in the area, they do exercise a high influence on these processes, through financing projects for environmental education for the zone. Based on characterization of the above table, Figure 1, shows the map of relationship among actors.

Figure 1. Network of relationships of environmental education among actors of the basin.



The above network of actors may be interpreted parting from the following premises:

1. The network analyzes relationships among actors with the topic of environmental education in the basin of Melua river
2. The circles represent nodes (actors) and the lines represent relationships among them.
3. Education centers of the basin are the central node, that is, school with all of their actors: directors, teachers, students, and parents.
4. Nodes close to the central one, are the most important for the network, and their size shows the influence or weight actually exercised on

the process; the larger the size is, the more influent or major weight, and otherwise, the less size the less influent or less weight, but they continue to be very important for the network.

5. Nodes far from the center are of less importance for the network, but their size shows the influence of weight they may finally hold in the network. In this case, large insulated nodes, are structural for the network, which finally result of a heavy weight.

According to the above, it is possible to conclude that there are nodes (actors) of a high importance, but badly listed in the network, or with no hierarchy, that is, they are key but do not exercise an role of function, they are: the Municipal Mayor's office with its offices (UMATA, and Secretary of Education), the Government of Meta (Secretary of Education), and Cormacarena. In addition, there are actors who, not being so important or key in the process, are playing an important role and end influencing the network, such as the community, which is the key actor in the process and could be playing an important role in the process, like the VETRA which is a moderately important actor, but it notoriously influencing the process, at least, in current moment.

The farthest nodes from the central one, such as universities, SENA and organizations, are important for the network, but badly related, since they do not play any important role, that is, they are practically absent from, or non-visible for the network.

The network requires for its proper, and sustainable operation, and to cause impact on the topic of environmental education in the basin, that key nodes or high importance properly play their role, and become highly influent, such as the municipal Mayor's office of Puerto Lopez, and Cormacarena.

In a second place the universities, organizations, and the SENA. It could be claimed that there is a network in the topic of environmental education for the basin, but very weak and depending on external actions, such as the ones performed by the VETRA, a private actor which will eventually withdraw from the territory, the network could become weaker even at the extent of disappearing. Therefore, it is required more actions by

strategic actors for the network, and relation actions (synergies) among them, that is, Cormacarena should establish a permanent relationship of discussion and dialogue with the mayor's office and organizations, on processes which they could promote in the basin in order to strengthen environmental education processes.

Conclusions

- Current status of environmental education in the Department of Meta is slow and paused, first, parting from analyzing the instruments provided by the National Policy on Environmental Education, which lack of a clear definition from stated strategic objectives, which makes it difficult to advance toward consolidation of public policies on this matter; there are no strategies which inject deep transformations, for example, creation of a program or agenda which includes institutional coordination.
- There are some efforts to provide strategies to improve environmental education in the Department of Meta; notwithstanding, one of the greatest weaknesses to make it possible, is the fact that such efforts have been made in insulated basis, without developing control methodologies to verify compliance, or proper progress, which shows that instruments provided from environmental education have involved poor systems for evaluation, tracking and monitoring. There is no a proper process to measure impacts in this matter, strategies to be implemented in the various plans and documents reviewed are hardly noted, but not how actions in the topic have been performed.
- Municipal environmental committees, although historically have played an important role on the ecological potential of this region, they actions have not been represented by a true environmental organization, which allows the Department to perform serious processes of education, protection, management, and much less complying with laws in effect on this matter, in order to perform processes which lead the municipalities to involve the various actors to the municipal reality.
- This work has evidenced the *deficit* in application of environmental policies from the education sector for the analysis unit

under study, where there is little commitment by the community in general to assume such process with responsibility; it is no longer a work to locate environment as a central axle of development, but it is indispensable to create conscience, associativity, and responsibility; the above has been shown by the alternatives given on the research. By placing environmental education as the basis of environmental education, from a global vision, it was seen that, in political, social, economic and environmental terms there are great regulating vacuums to place into operation proposals that promote optimal development of this territory, which situation is not new in Colombian territory, if variables such as Human Development index is analyzed.

- It could be stated that there is a network in the topic of environmental education for the basin, but it is too weak and depending on external actions, such as the ones performed by the VETRA, a private actor which will eventually withdraw from the territory, then the network could weaken at such extent that it will disappear. It is then required more action by strategic actors for the network, and coordination (synergy) among themselves, that is, that Cormacarena coordinate with the Mayor's office, and the other organizations or agencies those processes that they could perform in the basin to strengthen environmental education processes.

Bibliographic references

- Abello, R.** (2009). La investigación en ciencias sociales: sugerencias prácticas sobre el proceso. En: *Revista investigación y desarrollo 17(1)*, 208-229.
- Centro de Estudios Ambientales. (CEA).** (2008). Universidad Autónoma de Manizales. Municipio de Puerto López. Departamento del Meta. Recuperado de: <http://www.autonoma.edu.co/proyeccion/cea>.
- Comité Técnico Interinstitucional de Educación Ambiental del Meta. Colombia, (Cidea).** (2008). Villavicencio. Recuperado de: http://elcastillo-meta.gov.co/apc-aa-763663362623038643464343636/DECRETO_No_077A_2008.pdf.

- Cormacarena.** (2005). Plan de Acción Regional en Biodiversidad de la Cuenca del Orinoco 2005-2015. Colombia. Villavicencio. Recuperado de: <https://www.cbd.int/doc/world/co/co-nbsap-oth-es.pdf>.
- Cormacarena.** Plan de Acción Trienal 2007-2009. Síntesis ambiental Corporación para el desarrollo sostenible del área de manejo especial La macarena. Recuperado de: [Plan%20de%20Accion%20CORMACARENA%202012-2015.pdf](#)
- Corporación** para el Desarrollo Sostenible del Área de Manejo Especial la Macarena (Cormacarena)(2007). Ajuste Plan de Acción 2007/2011 Colombia, Cormacarena. . Villavicencio. Recuperado de: <http://www.cormacarena.gov.co/>
- Guzmán, L** (2009). Influencia de los factores aceleradores del conflicto armado del Meta en la dificultad del desarrollo del departamento. (Tesis de grado). Universidad Colegio Mayor de Nuestra Señora del Rosario. Bogotá, Colombia. Recuperado de: <http://repository.urosario.edu.co/bitstream/handle/10336/1094/53070419.pdf?sequence=1>.
- Leff, E.** (2004): Educación Ambiental: Perspectivas desde el Conocimiento, la Ciencia, la Ética, la Cultura, la Sociedad y la Sustentabilidad. Ponencia presentada en I Congreso Nacional de Educación Ambiental para el desarrollo sustentable de la Córdoba, Argentina. Recuperado de: servicios2.abc.gov.ar/.../archivosparaimprimir/19_ciudadania_st.pdf.
- Ley 388.** (18 de julio de 1997). Por la cual se modifica la Ley 9 de 1989, y la Ley 2 de 1991 y se dictan otras disposiciones. Recuperado de: <http://www.alcaldiabogota.gov.co/>.
- Ministerio de Educación Nacional.** (2008). Evaluación de la articulación del Plan Educativo del departamento del Meta con el Plan Sectorial y el Plan Decenal de Educación. Plan de Desarrollo 2008-2011 “Unidos gana el Meta”. Componente Educativo. Recuperado de: http://www.plandecenal.edu.co/html/1726/articulos-184500_archivo_pdf.pdf.
- Ministerio de Educación Nacional.** (2009). Plan Sectorial 2006-2010 de la política de Revolución Educativa. Bogotá. Recuperado de: <http://www.mineduacion.gov.co/1621/w3-article-152036.html>.
- Organización de Naciones Unidas.** Objetivos de Desarrollo del Milenio . (2009). Secretaria de Planeación y Desarrollo Territorial. Recuperado de: www.un.org/es/millenniumgoals/pdf/mdg-report-2013-spanish.pdf.
- Plan Básico de Ordenamiento Territorial.** (1999). Diagnostico urbano, municipio de Puerto López Colombia. Recuperado de: <ftp://ftp.ciat.cgiar.org/.../planificacion/POT%20PL/.../documento%20>.
- Plan de Desarrollo** económico y social del departamento del Meta 2102-2015 (2012). Colombia, “juntos construyendo sueños. Recuperado de: <http://www.meta.gov.co/es/plan-de-desarrollo/>.
- Plan de gestión ambiental** regional del departamento del Meta 2010/2019 www.meta.gov.co/wp-content/uploads/2013/.../Plan-de-Accion-2013.pdf.
- Ministerio de Educación Nacional.** (2006). Plan Decenal de Educación 2006-2016. Colombia. Bogotá: MEN. Recuperado de: <http://www.plandecenal.edu.co/html/1726/w3-channel.html>
- Plan Nacional de Desarrollo.** Prosperidad para todos. (2010). Sostenibilidad ambiental y prevención del riesgo, Bogotá. Recuperado de: <https://www.dnp.gov.co/Plan-Nacional-de-Desarrollo/PND-2010-2014/Paginas/Plan-Nacional-De-2010-2014.aspx>.
- Rivarosa, A.** (2004) Los proyectos escolares en la educación ambiental: su potencial educativo y transformador. Tomado de: <http://www.ambiente.gov.ar/infoteca/ea/descargasrivarosa02.pdf>.
- Secretaria de Planeación** y Desarrollo Territorial. Colombia, Gobernación del Meta. (2009). Sistema integral de información departamental (SIID). Villavicencio. Recuperado de: <http://asamblea-meta.gov.co/apc->