

# **THE ENVIRONMENTAL IMPLICATIONS OF monocultures IN COLOMBIA. THE CASE OF THE SUGAR AGRO IN THE VALLE DEL CAUCA**

Brigette Cortés Ortiz <sup>1</sup>

*1 Sociologist, Universidad del Valle (COL) Magister in Habitat, Universidad Nacional de Colombia in Manizales (COL) a doctoral candidate in Social Sciences, National University General Sarmiento (ARG) Teaching University Institution Antonio Jose Camacho (Cali)*

Received February xx 20xx. Accepted June xx 20xx  
*Received: February xx, 20xx Accepted: June xx, 20xx  
(Times New Roman 10pt and italics)*

## **ABSTRACT**

The purpose of the following article of reflection is to present some guidelines as to the idea called the environmental implications of monocultures in Colombia, having as main shaft one of the main sources of the economy the Cauca valley: the agro-industrial model of the sugar, which generates environmental implications in its area of influence.

The article contains multiple sessions. The methodology used environmental "State/Pressure/Response", which is based on the research and in which it develops different qualitative and quantitative indicators to get a holistic view. At the same time are the notions of development and environment, in accordance with the contributions of the intellectual output of the ECLAC, Ulrich Beck and Anthony Giddens.

The center section of the article contains a description of the environmental impacts related to agro-industrial development of the sugar geographic valley of the Cauca River, which can elucidate the pressures that this model has been exercised in the natural resources, which allows you to indicate which impacts on the water, soil, air, have impacted and continue to do so in the living conditions of rural settlers of the area of influence of the sugar mills. Finally, it will be seen as it is possible to achieve some alternatives to the model are presented as a conception of development that should be analyzed, from social components, natural, economic and political, resulting in the construction of an environmental culture to the region.

## 1. INTRODUCTION

### Theoretical Approaches Relevant

At present, there is a dynamic production, which allows the capitalism reproduced and grow on the basis of various resources (natural, financial, human, etc. ), linked to the creation of "human needs" that occupy an important place in the productive processes.

The forms of appropriation of the nature on the part of the human being in order to meet these requirements as have been confronted with the increasing deterioration of the most frequent natural resources, surpassing its function of refitting, tank and stand, "the great promise of unlimited progress (the promise to dominate nature, material abundance, of the greatest happiness for the greatest number of people, and the personal liberty without threats) has sustained the hope and the faith of the people since the beginning of the industrial era" (Fromm, 1991). However, the causes and consequences of the environmental crisis advise us that we are coming to one of the most crucial paradoxes facing humanity.

In this regard, they can be mentioned three perspectives that address the environmental history; in the first term, the intellectual production of bodies such as the Economic Commission for Latin America -ECLAC-, in the heat of the reflection on the environmental consequences of economic development. Secondly, with the contribution of authors Ulrich Beck and Anthony Giddens - that question these consequences from a perspective of critical to the development itself as feasible goal within the framework of our forms of insertion in the contemporary world system.

"The development is, in itself, a social process" (Cardoso and Faletto, 1981) of relations between groups, forces and classes through which some try to impose on the entire social fabric a form of maintenance or propensity to change is that you own, with all the political impact, social, cultural, economic and environmental balance in the consequent of the groups, both in the local scenery as in the global.

This implies that each "vision of the world" prints in the historical context two fundamental aspects; the ideology and the method of analysis. "Therefore, if you want to perform a survey of the different approaches of current development will be necessary to examine these positions from an ideological point of view and also methodological, indispensable to define each position in terms of the objectives, goals and aspirations that is supposed to meet development" (Sunkel and Peace, 1978).

One of the major implications of the development models with greater dissemination is currently the environmental problems, in which Donald Worster tentatively to developed the so-called environmental history , because it highlights phenomena, problems and issues that had no place in development policies.

"In other words, is part of the basis of that development policies and strategies that have no present conditions and the environmental effects are at risk, on the one hand, leaving perceive and exploit significant opportunities to make better use of resources, technologies, and environmental conditions that determine the level and quality of life, and on the other hand, to produce serious consequences, so unexpected and harmful, that can contribute to the failure of these policies and strategies" (Sunkel, 1981).

The conception of that nature is always there, is losing its character given, this means that society and nature blend as Beck would say in a social nature (Beck et al, 1997), if natural today is inevitably linked to the social. The environmental study for the current period has emerged mainly in response to what is perceived as human destructiveness, in conclusion, the environment is seen as a social construction.

In the first instance, it was understood as environment only the biophysical component, referring to aspects such as: soil, water, air, minerals, energy, plants and animals. After with the popularization and social representation of these problems is the social component included: social actors, ideology, social representation, roles, which indicates the strong interaction between society and the biophysical environment.

The construction of a new paradigm, crosses and Shoaas well the field of power and of the production, by opening a new space of possibilities for social, economic and political life, it also raises a process of social construction of an environmental rationality.

Identification of socioenvironmental impacts : The cultivation of sugarcane to the production of sugar

Sugar agro in the geographic valley of the Cauca River is characterized by having a close relationship with the environment: natural resources and society. The interrelationship of the agribusiness with the atmosphere is very marked, mainly in this region and due to the wide geographical extension of this activity, its effects are magnified to the point of be considered to be one of the activities with the greatest impact, both from the beginning and at the end of the production cycle.

"For the researchers to monitor, "the industry of Valle del Cauca records in its exports the highest dependence on natural resources, in comparative terms with other regions studied". In accordance with Monitor, "the natural resources relate mainly to the bounty of the land of the Valley of the Cauca river geographical and climatic conditions existing in the"" (Monitor cited in Urrea and Mejía, 2000).

The increased production of sugar, according to Table 1, basically responds to two factors; first, to the continued process of technological diffusion in the field and in factory, which is being maintained by the sugar mills that is based on the research for more than 30 years that has advance CENICAÑA. Second, a significant increase of 13% of the harvested area of the fourth five years -1995-1999- the fifth -2000-2005- (ASOCAÑA (Sugar Growers Association), 2000).

The agribusiness sugar Geographic Valley of the Cauca River, is a sector whose production was more than two million tons of sugar, the increase in the production of sugar has been extremely significant. Only forty years ago the sugar production was 1,107,268 tonnes per year, for the decade of the eighties was 1,247,488 tonnes (ASOCAÑA (Sugar Growers Association), 2000), which represented additional 140,220 tonnes.

Table 1. Crushed Cane, area under cultivation and area harvested in Colombia 2001-2012

Caña molida, área bajo cultivo y área cosechada con destino a la producción de azúcar en Colombia 2001 - 2012			
Año	Caña molida (toneladas) <sup>(1)</sup>	Área neta sembrada (hectáreas) <sup>(2)</sup>	Área cosechada (hectáreas) <sup>(3)</sup>
2001	18.120.019	197.565	180.012
2002	20.505.446	205.023	169.419
2003	21.669.400	200.426	173.989
2004	22.165.278	201.849	177.687
2005	21.784.805	196.435	181.900
2006	22.019.933	199.401	187.272
2007	21.090.203	208.140	189.593
2008	19.207.728	211.932	154.777
2009	23.588.646	215.662	200.691
2010	20.272.594	219.309	177.729
2011	22.728.758	226.152	185.545
2012	20.823.629	233.988	207.193

Source: Annual Report Asocaña 2012.

## 2. MATERIALS AND METHODS

The universe of study in which the article is based on reflection is the sugar agroindustry geographical in the Valley of the Cauca River, because it is the monoculture with more number of hectares cultivated, taking into account the geographical location of the sugar mills in the area.

To achieve the identification of the environmental impacts are used the methodology called environmental pressure, state response -PER-. The methodology environmental pressure-state-response framework. The model P-E-R was developed by Tony Friend and David Rapport, widely known in the development of environmental indicators since 1979.

The latest achievement for Latin America of the PRESSURE methodology - State - Response, was done by Manuel Winograd, in the report: Environmental Indicators for Latin America and the Caribbean. Toward Sustainability in the use of land.

The CAPITA methodology comprises three main categories:

Pressure gauges: The first category refers to the pressures on the environment as a result of the interactions society-nature. There are direct and indirect pressures on the environment result from human activities, in this category of organization of indicators is the array of relationship activities Recursos-Naturales that was developed by the C. V. C. to assess the environmental impact.

Status Indicators: The second category of the model relates to the condition or state in which lead the pressures on the environment. These pressures on the environment lead to a particular state of the physical environment, chemical, biological as well as a condition of ecosystems and ecological functions. The state of the environment includes the social structure and population. Here were organized all the indicators that provide the status of the Valle del Cauca environment, water, air and soil.

Response indicators: The third category of the model, refers to actions that the societies generate, such as response to the pressure and the state, primarily, the leading development processes and the use of natural resources. These responses may be developed and applied at the level of governments. The organization of the response indicators was formed by environmental legislation relating to the agribusiness sugar and some measures with which we are trying to mitigate the environmental problems.

### 3. RESULTS

The agroindustrial complex sugar contemplates two activities in the array of activities-Natural Resources; agriculture where are located the crops of sugar cane and sugar Agro. In the first instance, agriculture where is located the cultivation of sugar cane has a high environmental impact (10) in 22 of the 27 natural resources established in the matrix.

Each of the above activities exerts a environmental impact in the following natural resources; the air, the climate, landscape, water reservoirs, rivers and streams, groundwater, soil, natural forests, wildlife and natural ecosystems. The valuation is set as follows:

- 0 When the activity has no impact on the natural resource.
- 1 Where there is a minor environmental impact.
- Averagely 5 appreciates the impact generated by the activity.
- AND 10 means a time of high environmental impact.

Table 2. Activities and environmental impacts in the Valle del Cauca

ACTIVIDADES	RECURSOS NATURALES	AGRICULTURA		AGROINDUSTRIA
		Cultivo de caña de Azúcar		Ingenios Azucareros
AIRE	Calidad	1	10	10
	Niveles de ruido	2	1	10
CLIMA	Temp/Prec/Ev/Hum.	3	10	5
PAISAJE	Calidad visual	4	10	10
AGUA				
EMBALSES-RESERVAS	Cond. Físico-químicos	5		
	Cond. Biológicas	6		
RÍOS-QUEBRADAS	Caudal de oferta	7	10	10
	Cond. Físicas	8	10	10
	Cond. Químicas	9	5	10
	Cond. Biológicas	10	10	10
	Profundización de canales	11	10	10
	Sedimentación	12	10	1
AGUAS SUBTERRANEAS	Potencial dis. (oferta)	13	10	5
	Cond. Físicas	14	1	10
	Cond. Químicas	15	5	10
	Disp. Espacial	16	10	10
SUELOS	Cond. Físicas	17	10	10
	Cond. Químicas	18	10	10
	Cond. Biológicas	19	10	10
	Vocación de uso	20	10	10
BOSQUE NATURAL	Cobertura	21	10	1
	Estructura	22	10	1
	Densidad	23	10	1
	Diversidad	24	10	1
FAUNA SILVESTRE	Cond. Ecológicas	25	10	10
	Ecología de las especies	26	10	10
ECOSISTEMAS NATURALES	Humedal- bosque seco	27	10	5
<b>Totales</b>			<b>222</b>	<b>175</b>

Source: Corporación Autónoma del Valle C. V. C.

The 22 natural resources are located as well: Air (quality), climate (temperature, precipitation, humidity, etc. ), Landscape (visual quality), rivers-streams (supply flow, physical conditions, biological, deepening of channels and sedimentation) groundwater (potential space available and availability), soils (physical conditions, chemical, biological and vocation of use), Natural Forest (coverage, structure, density, diversity), Wildlife (ecological conditions and ecology of the species) and Natural Ecosystems (wetland and tropical dry forest). The other remaining natural resources have a slight impact and only in the reservoirs and water reserves for human consumption will not cause any environmental impact. The total environmental impacts that generates

the agricultural activity of the cultivation of sugar cane sum 222, which are the highest of all productive activities.

In terms of the impact of agribusiness (sugar mills) we have that in 16 natural resources is also generated a high environmental impact, distributed as well; Air(quality), Landscape (visual quality), rivers-streams (supply flow, physical conditions, biological and deepening of causes), groundwater (physical and chemical conditions and space availability), soils (physical conditions, chemical, biological and vocation of use) and Wildlife (ecological conditions and ecology of the species). Other natural resources have a moderate impact.

The array of activities-Natural Resources shows us that some natural resources are doubly impacted by the development of agribusiness sugar cane, and that its overall impact is 397, which is extremely high for the region.

The second activity with the greatest impact is the forest activity with 210, settlements and urban concentrations with 200, the fourth place has mining with 186 and the fifth place with 175 agribusiness.

### Impact on the Air

The geographic region of the Valley of the Cauca River covers an important area of air pollution as a result of the accelerated process of industrialization; particularity that is observed, since around her are located various industries that together with the sugar contribute to environmental imbalance.

The agribusiness sugar generates five major impacts on the biophysical environment of the air; exposure to rubble and solid waste that develops particles in suspension, the fertilization either land or air which increases the nitrous oxide causing direct harm to human health and to other crops, the process of the industry in the boilers, the burning in feet and harvest and the exposure of air through the use of fossil fuels to generate the energy needed for agricultural machinery.

The generation of solid waste and debris is an effect that is found mainly in the adequacy of the physical infrastructure of the furrows and the factory, which increased with the spread of mechanical harvest due to several factors: the redesign of the fields and irrigation systems to enable the combines to travel greater distances, redefinition of the row spacing and the waste management of the cane in green. Similarly, the biotransformation is very slow, pesticides cause cumulative effects in exposed persons, if we have that its use is just being brought to the fifty years in the region the Cauca valley. In these circumstances, some sugar mills began a few years ago to increase the biological control program to gradually replace the use of agrochemicals.

The burning of foliage of sugar cane originated two significant effects to direct the air; the pavesa or ash and gases. In spite of the commitments and actions of the sugar sector trade union in the convention of clean production, on dealing with all the environmental impact that the production process involves the sugar, the fronts and action plans were directed more toward the environmental problem of the production of pavesa.

Including the management that was given to this problem in some of his speeches is argumentative in between such as follows: to Cenicaña "the pavesas produced by the burning of the sugar cane harvest before the cause environmental problems and consequently social in the villages near crops" and for the office of environmental management of ASOCAÑA (Sugar Growers Association), "the pavesas are more of an annoyance, that a health problem. However, if you can consider as air pollution because they "interfere with the welfare of the people" ( ..) your solution was not to eliminate the burning but handle them technically and

respect the exclusion zones to prevent them falling into urban areas" (ASOCAÑA (Sugar Growers Association),).

The burning of foliage of sugar cane not only emit pavesa but concentrated emissions of gases such as; the photochemical, ferriacetilnitrato (bread), ozone and other pollutants that are also photochemical, polynuclear aromatic hydrocarbons (PAHS) that are highly carcinogenic (Calero, 1996), confirming the incidence of these problems on the health and quality of life of rural populations, to describe in detail the negative effects on the health of these pollutants.

#### Impact on the Water

The main water jets geographic valley of the Cauca River are found in three units of watershed management; Bolo-Frayle -disrupted (Meadow, Candelaria and Florida), Nima-Amaine (Palmira) and Sonso-Guabas - Zabaletas (Geneva and El Cerrito), which are located precisely in the area of greatest concentration of the cultivation of sugar cane.

In the area where it is usually found localized sugar agro the Cauca valley, is the right margin, in which there are several changes in the quality and quantity of water described as: changes in the natural systems of drainage, reduction and water capacity, quality of the water (effluent); eutrophication, sedimentation, runoff, and contamination by agricultural chemicals.

The dispensed water toward this sector meant that in some municipalities especially Palmira and Florida riverbank Amaine, Nima and Frayle, the change in the natural systems of drainage or cause, they are no longer without water on many occasions to the holdings of some rural residents and that in the wake of this unique situation decided to sell their farms to the enterprises cane.

The main use of water is performed in work of irrigation which is essential to ensure the cultivation of sugar cane. In one hectare water losses in the way of irrigation ranged between 10% and 40% of the water resource available, thus becoming one of the most expensive work of the crop, and in which the technology of irrigation and drainage are the most widely used technologies between 98.7 % and 87.3 % respectively, "in general, the efficiency of the irrigation applied by gravity or surface is low due to the loss of water in the ditches and sprinklers in the furrows" (CENICANA). This technique has been used extensively by the pole and line, making the water resource a heavily injured.

Sugar agroindustry adopted a series of technologies, which will minimize the application volumes (avoid excess water) and therefore, increase the yield in the irrigation, was necessary to reduce the losses in the pipes to the lots of sugar cane with the irrigation, for example, the politubulares, furrow irrigation alternated with increased flow rate and water balance, which requires a large investment of capital in order to achieve optimize the work of irrigation. Although, the pressure of the water resource is continuous because it is opting for perforations in the groundwater.

Sugar agroindustry adopted a series of technologies, which will minimize the application volumes (avoid the excess water) and therefore increase performance in the irrigation, was necessary to reduce the losses in the pipes to the lots of sugar cane with the irrigation, for example; the politubulares, furrow irrigation alternated with increased flow and water balance, which requires a large investment of capital in order to achieve optimize the work of irrigation. Although, the pressure of the water resource is continuous because it is opting for perforations in the groundwater.

The rate of adoption of the technologies of alternate furrow and the adoption of cane growers toward the water balance have not yet been widespread in the cultivation of sugar cane, since only 53.4 % of the



cultivated area is using a new technology of alternate furrow, which can reduce the application volumes up to a current average of 1,200 m<sup>3</sup>/ha/irrigation with an efficiency of implementation of the 50 %, resulted in an average savings of 1,000,000 m<sup>3</sup> of water at three months of irrigation depending on the type of soil, and water balance has an adaptation in the area of 33,3 %, facilitating the management of the flow, because it is based on predictions that determine the Changes in soil moisture.

The predictions made according to the water balance for the year 2020 indicate that the available flow rate will be of 244, 83 m<sup>3</sup>/sg with a demand of 102.19 m<sup>3</sup>/sg for all the right margin of the Cauca River where the agricultural sector is the largest plaintiff. This water balance represents for the operating unit of watershed a strong pressure of the water resources given the capacity of the flow of each of the rivers.

The eutrophication process may cause cosmetic problems, such as bad taste and odor, and an accumulation of algae or Verdin disagreeable in view, as well as a dense growth of plants with roots. Sedimentation also occurs by the burning of foliage of sugar cane, since the pavesas or ashes are deposited in rivers, streams, lakes, lagoons, ponds, etc.

Finally, the water pollution caused by agrochemicals, da in different ways, among the most important are: the drag of the contaminant in lands that have been subjected to the action of the biocidal products (pesticides), either by rain water, or by the use of the same irrigation water for the crops, the aerial spraying carried out near the ravines, creeks, rivers, etc. has long been well-known or suspected of the dangerousness of inorganic substances, but on many occasions the consequences newly emerging in the region.

#### Impact on the ground

"The ownership of this bountiful land, under its various historical forms, has been a component of the corporate culture of the region. It is not arbitrary that one of the axes of regional socio-economic development is the sugarcane agro-industry" (Urrea and Mejía, 2000). The pressure on the soil by the speech called sugar guild "exceptionally fertile lands of the Valle del Cauca", which is the cultivation of sugar cane is enormous, especially in the municipalities of Palmyra and Candelaria, which have three basic characteristics that already described; larger area planted with sugar cane, more fertile soils with respects to the other municipalities in the department and are the most pressure on natural resources, such as water, soil, etc-.

It is also only a 11% can be considered as land "exceptionally fertile", which will have no environmental problems (at least in the short and medium term) supporting the monoculture of sugar cane, the rest of the soil Vallecaucano is prone to degradation of the monoculture itself. "This phenomenon of the artificialisation of crops comes the problem of the specialization of the soils that arises as a result of the objective to maximize the productivity of a resource (and also very related with the idea of comparative advantage as a principle of the development policy). Specialization can lead to greater productivity, but also generates conditions of greatest weakness, something well known in agriculture" (Sunkel, 1981).

The natural resource of the soil is the most clear that pure entrepreneurs turned to this, a factor that determined the social organization, given its limited capacity of social mobility, determining the monoculture. The suitability of the land that leads to the monoculture of sugar cane and its permanent practices of mechanization and use of tillage implements sophisticated, cutting and harvesting, have degraded soils doubting compactandolos more superficially and internally, generating environmental impacts on the ground as: salinity, drainage, loss of structure, compaction and loss of productive potential for leaching and other problems related to contamination by agricultural chemicals and waste.

Reduced tillage that is gaining acceptance, but only 17.1 % (CENICAÑA) of cane growers -sugar mills and cane suppliers-, of this stage depends on obtaining large productions, due to that allows you to perform the work with excesses of moisture in the soil.

At the present time, the 93.1 % of the area of cultivation of sugar cane, is using ripeners, which are chemicals whose function is to eliminate the so-called weeds, understanding for those plants whose presence is not desired next to a particular crop. The herbicides act by removing the weeds or avoiding that these transplants, depending on their chemical composition, its action is exerted on photosynthesis, the hormonal balance or metabolism of plants.

The ripeners reduces the populations of insects using, the adoption of sanitary measures, the appropriate rotation of crops, the elimination of the crops, the elimination of weeds and previous crop or the employment of risk systems that are crippling the possible survivors of other crops. All these practices change in the biophysical environment in that inhabits the insect, making it more difficult for manages to survive.

Another of the consequences of the burning of foliage is violence that occurs in the soil, which is high, because it robs the land of nutrients and moisture your fertility decline in normal conditions that generate the waste of the cane leaf fell to the floor. Similarly, there are losses of nutrients from the soil, when the ash falls to the ground and salinity and while there are no beneficial effects that bring the decomposition of the waste from the leaves of sugar cane, the earth will continue to lack of nutrients to help you preserve your fertility.

The Social and Environmental Responsibility Sugar of agro-industrial development in the Valley of the Cauca River Geographic

In spite of the growing discussion with respect to the positive or negative relationship between the companies dedicated to the cultivation of sugar cane and the environment, it is impossible obviate the environmental impact caused by the production systems that has configured the risks of the industrial model. The alternative now followed by employers, is to incorporate the environment as part of the enterprise business. "The responsibility allows you to be competitive in the time and have permanence in the activity. Worry about the environment is, therefore, in accordance with Ricardo Villaveces Pardo, the most appropriate manner to ensure conditions for making a good activity that takes place at the same time that is accomplished the solidarity with the sector, because the people participates" (ASOCAÑA (Sugar Growers Association)).

This activity of "solidarity" is rather as annotated Urrea and Mejía a philanthropic practice (Urrea and Mejía, 2000), product of the transfiguration of the paternalistic systems used since the beginning of the sugar industry, and that have been framed in a new role of social welfare intervention, helping communities in different programs and activities such as; housing programs, health, education, leisure activities, etc. "However, the valuable efforts may be insufficient but it consolidates a social, economic and cultural development that integrates the population to the whole of social life regional, with criteria of social equity and with an offer of goods and services that contribute to the creation and development of public spaces" (Urrea and Mejía, 2000).

The environmental investment that made the sugar mills, in spite of being high, necessary and important, shows no real conviction in front of the think, conceive and plan in the long term, the future of the environment and development in the region. In this way, the business sector is facing a double challenge before the environmental objective; on the one hand, it incorporates the environmental component in the strategy of the company, making the necessary investments in research and development of clean technologies, modification of processes, corrective actions, waste management, etc. , and on the other hand, leaves the solid bases for that rural people improve their quality of life.

Table 3. Environmental Indicators

Indicadores ambientales e inversión en investigación del sector azucarero colombiano 2001 - 2012	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Consumo de Energía por tonelada de azúcar (GJ)	22,0	21,8	20,5	21,0	20,8	19,5	20,6	23,9	18,2	30,7	21,7	20,5
Carga de DBO5 en Efluente por tonelada de azúcar (kg) <sup>(1)</sup>	1,5	1,1	1,1	1,6	1,0	1,2	1,4	1,7	1,1	1,3	1,6	1,6
Carga de DQO en Efluente por tonelada de azúcar (kg) <sup>(1)</sup>	2,1	1,5	2,5	2,5	2,1	2,5	2,9	3,5	2,1	2,5	3,2	3,5
Sólidos Suspendedos Totales en Efluente por ton. de azúcar (kg) <sup>(1)</sup>	0,5	0,6	0,6	0,5	0,4	0,4	0,4	0,5	0,3	0,5	0,6	0,7
Caudal Efluente (litros/segundo) <sup>(2)</sup>	759	556	971	584	564	580	618	667	476	354	387	347
Total Inversión Ambiental (millones de \$ de 2012) <sup>(2)</sup>	15.377	24.592	26.978	26.998	35.354	68.564	22.391	20.403	51.086	54.431	46.400	52.031
Presupuesto del centro de investigación CENICAÑA (millones de \$ de 2012)	13.838	13.383	12.864	11.371	11.831	14.591	11.874	10.079	18.017	16.575	19.856	17.791

Source: Annual Report Asocaña 2012.

It is necessary for companies to plan an entire strategy of development in the detection of the current and future challenges that the activity poses to the environment. To this end, we must go beyond the disciplinary and sectoral boundaries, time and space, to address the reality with its systemic interdependence, its limits and its complexity.

Achieving harmony between the environment and economic activities will depend on a small part of the technological progress with regard to environmental protection, but essentially there should be a serious and profound change in society as a whole, without exception, in terms of attitudes and commitments toward the environment, i.e. it is necessary to construct an environmental culture.

The Environmental Culture can be defined as an attitude of the management of the company that involves a commitment to carry out a cultural change generated in the concern that their activities have on the environment; but that cultural change not only remains in the organization but there must be an attempt or desire to move it to the rest of society. To achieve this end, the social and environmental responsibility of companies devoted to the cultivation of sugar cane, you will need to turn around a new social value of a new paradigm of economic rationality.

#### 4. DISCUSSION

What about the rural dwellers Pacifico that?

To the extent that they increase the area cultivated with plants of the same species, such as the cultivation of sugar cane in geographic valley of the Cauca River, there is a restlessness latent in the rural dwellers with a

new ingredient; the environmental degradation that threat and endangers the quality of life, increasingly affecting the quality and quantity of resources; air, water and soil, fruit of the characteristic rhythm with that agricultural activity looking for high productivity in the short term. "If before the haciendas were the mills today continue the expansion, since the aerial spraying we have just, although supposedly are for the cane. This ends up with everything that one has sown, Santiago Rodriguez. He adds that in addition to the worm "pin", the pesticides were completed a few years ago with the cocoa" (holes, 1996).

The pace of industrialization of the sugar cane the Cauca valley makes the problem of efficiency is a purpose or a contradiction of every day, mainly due to the complex uncertainty of natural resources in the regions with the highest pressure on them.

The side effects and autoamenazas caused by environmental deterioration in the geographic valley of the Cauca River which has remained and still some are invisible, are produced in a systematic way and often irreversible, but to become topics of public debate were minimized, reduced, or diminished in the center of the political conflicts of another order, environmental.

According to the two contemporary authors "intensive agriculture expanded today, it is not indefinitely sustainable. Uses large amounts of chemical fertilizers and insecticides, destructive to the environment. We cannot return to the more traditional modes of cultivating the land and still expect to feed the world population" (Giddens, 2000). It is not necessary to raise here that the solution to the environmental problem is an involution, or deceleration of the development on the basis of sugar cane in the geographic valley of the Cauca River, the expansion of the risks does not break at all with the capitalist logic, but that elevates it to a new level of modernity, the thoughtful proposal by Giddens and Beck (Beck et al, 1997).

In the geographic valley of the Cauca River, the invisible dangers that until now generates sugar agro-industry development will become visible when the latent phase of the threats of the risk comes to its end, the damage and destruction to the nature is no longer consume only out of personal experience in the field physics, chemistry or biological effects chains, but each time jump with greater clarity to the hearing, the smell and hearing. The end of the latency has two faces: the venture and its public perception. It is well known that in the region the Cauca valley, this stage is located on the first stage of the risk characterization. Is never clear whether the risks have intensified or have done our vision of them.

## 5. BIBLIOGRAPHIC REFERENCES

- ASSOCIATION OF CANE GROWERS (2012): General Aspects of the Sugar Industry 2011 - 2012, Cali, ASOCAÑA (Sugar Growers Association),.
- Beck, Ulrich (1998a): The risk society. Toward a new modernity, Barcelona, Granta Books.
- \_\_\_\_\_ (1998b): What is globalization? Fallacies of globalism, responses to globalization, Barcelona, Granta Books.
- Beck, Ulrich et al (1997): Reflexive modernization. Politics, Tradition and aesthetics in the modern social order, Madrid, Editorial Alliance.
- CALERO, Alba Patricia (1996): Environmental Impact caused by the burning of foliage of the sugar cane, Cali, Faculty of Humanities, Undergraduate Program in Social Sciences, Universidad del Valle.
- CARDOSO, Fernando and FALETTO, Enzo (1971): Dependency and Development in Latin America Test Interpretation of Sociological, Bogotá, twenty-first century.
- CASTRO, William (1994): The work of setting and combat: Nature and Society in the History of Latin America, Bogota, Editions Casa de las Americas.
- RESEARCH CENTER OF THE SUGAR CANE (2012): Annual Report 1997, Cali.
- COLMENARES, German (1983): Landowners, miners and traders, Bogotá, Universidad del Valle - Banco Popular.
- CORPORACIÓN AUTONOMOUS OF THE VALLE DEL CAUCA (1997a): Environmental Management Plan for the Valle del Cauca. A vision of the future, Cali, Corporación Autónoma del Valle del Cauca.
- \_\_\_\_\_ (1997b): Figures of Earth and Life. Figures of the Environment in the Cauca Valley 1995-1997, Cali, Corporación Autónoma del Valle del Cauca.
- Fromm, Erich (1976): do have OR Be?, Mexico, Fondo de Cultura Económica.
- Giddens, Anthony (1995): Modernity and identity of the i, Barcelona, Editions Peninsula.
- \_\_\_\_\_ (2000): a World run amok. The effects of globalization in our lives, Madrid, Editions Taurus.
- HOYOS, Guido (1996): "The Valley of the peasants of City", in the country of Cali, Gazette Sunday, Sunday, February 18 1996.
- ROJAS, José María (1983): Entrepreneurs and technology in the formation of the sugar sector in Colombia 1860 - 1980, Bogota, Universidad del Valle - Banco Popular.
- SOCIETY OF FARMERS AND ranchers OF VALLE DEL CAUCA (1984): the Valle del Cauca. Land and people. A vision of their agricultural activity, Cali, Society of farmers and ranchers of Valle del Cauca.
- Sunkel, Osvaldo (1981): The Environmental Dimension in the Styles of Development in Latin America, Santiago, Chile, ECLAC - UNEP.
- Urrea, Fernando and MEJIA, Carlos (2000): "Innovation and Culture of the organizations in the Valle del Cauca" in Urrea, Fernando and et al (comp.) Innovation and Culture in three regions of Colombia, Bogota, Colciencias - Corporation Quality, pp. 83 - 218.

WINOGRAD, Manuel (1994): Environmental Indicator for Latin America and the Caribbean: Toward Land-Use Sustainability, the United States , World Resources Institute.