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Construction of new sustainable spaces respecting cultural diversity at the local level

Construir nuevos espacios sostenibles respetando la diversidad cultural desde el nivel local

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ABSTRACT

The extractive activity is unsustainable, as evidenced by the impacts it generates in the strategic ecosystems of the city of Bogotá and its population. This, added to the economic and political interests of the different actors, causes controversies and exacerbates environmental problems. For these reasons, it is necessary to create environmental awareness in search of sustainability to recognize cultural diversity and, with it, give way to creating new spaces based on the integrity and dignity of people and other living beings. This manuscript presents a series of proposals and alternatives for reconfiguring the city from a respectful dimension of diversity to achieve sustainable growth that guarantees the quality of life of all its inhabitants.

Keywords: mining activity, regulatory weakness, discrepancies, impacts, environmental problem, territorial reordering

JEL classification: Q56; Z19.

RESUMEN

La actividad extractiva es insostenible, lo que se evidencia en los impactos que esta genera en los ecosistemas estratégicos de la ciudad de Bogotá y en la población que los habita. Esto, sumado a los intereses económicos y políticos de los diferentes actores, genera controversias y agudiza los problemas ambientales. Por estos motivos, es necesario crear conciencia ambiental en búsqueda de la sostenibilidad, para reconocer la diversidad cultural y, con ello, dar paso a la creación de nuevos espacios basados en la integridad y la dignidad de las personas y de todo ser viviente. En tal sentido, el presente manuscrito presenta una serie de propuestas y alternativas para la (re)configuración de la ciudad, desde una dimensión respetuosa de la diversidad, a fin de lograr un crecimiento sostenible que permita garantizar la calidad de vida de todos los habitantes.

Palabras clave: actividad minera, debilidad normativa, discrepancias, impactos, problema ambiental, reordenamiento territorial

Clasificación JEL: Q56; Z19

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INTRODUCTION

In Colombia, for more than 40 years, the environment has been deteriorating due to the impacts generated by socio-economic activities, especially the mining activities carried out in the territory. The effects are evidenced in the increase in causes of morbidity and mortality among people, with children and older adults being the most affected. The territories, in turn, suffer transformations and damages that, in most cases, are irreparable, posing risks to resident inhabitants. Therefore, it is necessary to generate changes to the current economic system regarding the exploitation of natural resources, including modifications to regulations, their enforcement, and implementation, so that they translate into better living conditions for the population, especially the poorest and most vulnerable.

Since the 1950s, ecosystems in Colombia have undergone transformations that coincide with the period of greatest population and economic growth. The introduction of technology has changed the relationship between man and nature, as the vocation in land use from agricultural to residential or mining exploitation is not respected. These actions have resulted in environmental problems and dissatisfaction, crisis, scarcity, and disparate relations among the actors involved in the territories. This is most frequently evidenced at the local level due to executed investments, the export of natural resources, demographic growth, and the awakening of environmental awareness.

The objectives of this article focus on the compilation of investigative supports from the theoretical and conceptual concepts of the man-nature relationship, in which cultural diversity and discrepancies between people sharing the territory are recognized, driven by their perceptions and interests. It also seeks to create environmental awareness and encourage public decision-makers to implement policies that respond from complex thinking to the needs and priorities of the territories. This seeks to contribute to the construction of a country oriented towards sustainability, in which the result of management is the satisfaction of the needs of present generations without compromising the needs of future ones.

This research was carried out through the recognition of the territory. From this, the limitations of natural ecosystems and their functions were evidenced. Since they are the source of environmental goods and services to meet the needs of living beings, they have use restrictions. When socio-economic activities are developed in these fragile and vulnerable spaces, imbalances are generated, transforming into irreparable ecological damages (Hernández et al., 2015). The occupation of the territory aggravates this situation due to the displacement of the population and the changes in urban configuration. Therefore, decision-making is essential to avoid expanding extractive activity in these ecosystems. The aim is to investigate the construction materials and clay exploitation sector and its relationship with the economy, which constitutes a guide for developing new research on environmental issues in different geographical spaces.

To begin with the analysis, we must consider that, from systemic geography, environmental problems have to do with the difference between the time nature requires to create and develop ecosystems and the times in which society (culture) makes use of natural resources, whether for extraction, transformation, or consumption. While the former requires decades or centuries for their conformation, the latter, using cutting-edge technology, are performed in days and hours. This theory evidences how ecosystemic structures are organized and how their accelerated transformation threatens to destroy them. It is also based on demographic growth and accelerated production processes, shown in current environmental problems, and their resolution must be generated from the man-nature relationship.

To identify and characterize the environmental problem caused by mining activity in southern Bogotá, the distribution of non-renewable natural resources was considered, in this case, construction materials and clays. The components related to sustainability were included, related to the social component, public policies, social movements, and social relations of production. In southern Bogotá, extractive activity is developed, integrating management and receiving pressure by modifying physical spaces by exploiting non-renewable natural resources (Guhl, 2008, cited by Montero and Viales, 2015). This activity involves the population and its socio-economic and cultural activities, integrating abiotic (non-living) elements with biotic (living) organisms that makeup ecosystems.

Feeling affected by the impacts generated by mining activity, the inhabitants of this geographical space oppose the continuation of activities, expressing their dissatisfaction based on the transformation and damage the territory has suffered and the different economic and political interests guiding extractive activities. This generates two types of discrepancies: those arising from relations between human beings, and those caused by the market structure, as the axis in which they interact. These discrepancies can be seen from the perspective of environmental, social, political, organizational, regulatory, or international problems. However, to determine them, the establishment of policies that include management actions involving planning, execution, monitoring, and evaluation is required (Bassa et al., 2017). The environmental problem generates discrepancies among people regarding the should be and the being, as it involves different levels from local to global, and its purpose is translated into the search for solutions that integrate these two perspectives in the socio-economic activities developed in the territory (Jasso and Mireles, 2019).

To characterize the differences among the people involved in the environmental problem, it is essential to know their needs, interests, and objectives because, although they share interests and objectives, there are controversies over values. Each actor assumes incompatible positions, and they focus on who loses and who wins (game theory) (Ruiz, 2019). Other disagreements are resolved by the power that each of the actors involved in the environmental problem has. In some cases, this is solved through negotiations between actors who can be at different levels (local, regional, national, or international) based on the state apparatus's norms and functionality. Such negotiations are reflected in development plans, in which entities, through projects, provide the facilities for socio-economic activities to be developed in the territory, for the case study, the mining of construction materials and clays (Alier, 2015).

The research allowed identifying environmental problems and controversies among actors who feel vulnerable

due to the impacts suffered by the territory, based on the variables that have influenced their creation and evolution, as well as non-compliance with current regulations. As a result, a proposal is presented to public decision-makers regarding territorial reorganization policies, in which the primary interest is that land uses are respected based on their vocation, and positive impacts are generated on both urban and rural populations in the affected region. It also aims to construct an input that invites the analysis and updating of territorial planning plans in their technical, economic, financial, institutional and legal, environmental, and social and cultural components so that, once approved, their implementation generates progress reflected in the well-being of people and the sustainability of the territory.

In the end, conclusions are presented, and strategies directed at decision-makers are suggested based on economic, social, and environmental indicators that allow measuring people's satisfaction (happiness) and evaluating impacts affecting strategic ecosystems. Also, duly regulated policy instruments are suggested, which exercise management, including the stages of planning, execution, monitoring, and evaluation. It is proposed as a necessity for implementing new strategies for diversifying export products in which the country has the potential to cover international demand and to create collaborative relations between the public sector, the private sector, and the civil and organized community.

METHODOLOGY

Field activities contributed to articulating concepts and theories based on the relationships between actors, whether direct or indirect. The knowledge and expertise of the people involved allowed for the understanding, identification, and classification of environmental problems and discrepancies, which helped to delimit the studied environmental area.

The information that underpins the research was obtained from primary and secondary sources. Among the primary sources was direct observation, which verified the state of the water system in the area. This observation enabled us to verify the progressive deterioration the area has suffered over mining activity (more than 50 years). With the cartography used, the modifications made to the river's courses and banks and the ravines were verified. These damages have been caused by mining companies and public entities of the district order, such as the Public Works Secretariat (SOP). In its early stages, it carried out the extraction of construction materials and clay. Another of the culprits was the Bogotá Aqueduct and Sewerage Company (EAAB), which, in trying to correct the damage caused to the river's courses and banks and the ravines, modified and transformed the territory, resulting in further deterioration and damage.

With people from the community, leaders, NGO members, committees, foundations, and associations, workshops, conversation forums, and local and interlocal meetings were developed. Local town halls convened activities that allowed dialogue, strategic alliances, joint action plans, and the agreement of objectives as part of participation strategies (Carro-Suárez et al., 2017).

Interviews and informal meetings with expert consultants on the mining issue, professors from different disciplines, researchers from various universities, presidents of mining companies, representatives of associations, and public servants from institutions of different government levels allowed for an understanding of their appreciation, knowledge, emotions, convenience, feelings, interests, and perspectives. Likewise, the application of surveys in different spaces allowed for understanding the perceptions of different people belonging to the civil and organized community about the proposed problem.

Secondary information that was considered valid, truthful, and timely was selected from different theoretical schools, teacher research, public institution reports, informative bulletins, and opinion journals, which allowed us to know, understand, and discern the problem addressed.

RESULTS

In the research, the following actors have been identified: the receptors or those affected, which are those people who receive the impacts or externalities resulting from mining extraction, as well as its effects, which directly impact health and generate insecurity in the territory due to the presence of lands with mass removal processes, population segregation, increased unemployment, poverty, and misery. Forty associations and NGOs were identified (Cepal, 2015).

Regulatory actors were identified as public institutions of different levels of government, that is, those of a

national, regional, district, and local nature, corresponding to approximately 90 institutions. These are present in the area, act by competence, based on legal provisions. Finally, we have the generator actors, the mining companies, corresponding to 96 companies and/or private (legal and illegal) guilds registered in the mining inventory. These actors cause the impacts or externalities produced by the productive activity.

Once the actors were identified, discrepancies in their relationship were evidenced due to the objectives they sought, motivations, and problems and/or needs they required to solve. This generates tensions determined by the appropriation, use, exploitation, ecological and economic distribution of resources and the externalities generated by mining activity. To identify the discrepancies between the actors, the Historical Graph tool was used, built with secondary information, through cartography, photographs, and information on changes in the configuration of the territory, based on land uses, landscape, economic variables, population, and neighborhood legalization.

Transformation of the water system

In the cartography of the District Planning Secretariat, the transformations and modifications that the Tunjuelo River has undergone in its channel in the round and hydraulic zone are evident for each of the decades. This corresponds to the area where large companies such as Holcim, Cemex, and Fundación San Antonio operate, which are the ones that have had the greatest impact on environmental problems. For the District Secretariat of the Environment (SDA), the four polygons in the urban area of Bogotá comply with environmental regulations. However, for representatives to the Chamber, this extractive activity should not be carried out in the city because it generates changes in the soil and subsoil and causes mass removal problems, which puts the life, integrity, and health of the inhabitants of the affected area at risk.

The impacts of water consumption in mining activity can be seen in all stages of the exploitation of construction materials and clays, especially in extraction and dust control for the transportation of minerals through treatment pools and consumption of the camps. Currently, these consumptions are made without concession permits. In addition, illegal mining activity uses motor pumps to remove and wash the material, wasting large amounts of water. This deficit is evident in times of drought due to the effects of climate change. In addition to the waste of water, mining activity discharges pollutant loads into rivers and streams, making their use impossible.

In addition to the above, the heavy machinery used in mining, such as backhoes and dredges, generates a large amount of sediment when removing the earth, which, when it comes into contact with water, dilutes the material, which then empties large loads of particulate material and sediment into the river. This translates into a direct impact on water quality.

Air quality

Mining activity generates pollutant emissions into the atmosphere, for example, dust in exploitation when dynamite is used as a detonator. This activity also pollutes during the loading and transport process of particulate material, with combustion gases due to the use of hydrocarbons, such as gasoline or diesel, either by the machinery used or by gases expelled into the atmosphere. In addition, in the extraction of construction materials and clay (carbon dioxide and cobalt), emissions are generated by gases from blasts and gases from mining activity processes loaded with elements that pose an environmental risk.

One of the pollutants that most affect the air element is PM10, derived from the industry and automotive equipment, in 60% and 40%, respectively. For the exploitation of construction materials and clays, this pollutant is produced by automotive equipment (dump trucks), which expel particulate material into the air (Juvinao et al. 2020). Another air pollutant is tropospheric ozone, whose emissions have increased since 2007 and have exceeded legal parameters. On sunny days, these gases present higher levels of pollution caused by the increase in automotive equipment circulating in the capital and emissions from fixed sources such as chimneys.

Landscape degradation

Legal and illegal mining operations need proper oversight to undertake activities and adhere to the required safety parameters. Furthermore, expanding these operations into new areas without prior studies to minimize risks from mass removal processes, landslides, and avalanches creates high vulnerability in these zones. These drastic changes in the territory, including the slopes of mountains, bring about certain consequences. For example, the saturation of soil with water and the exposure of slopes are some of the triggers and risks that affect the population. The destruction and progressive deterioration of the original landscape in Bogota and the savanna affect the

population. Of 4212.1 hectares of vegetative cover, only 85.3% is grassland, with tree cover at 4.8% and shrubland at 4.2%. Regarding the district park system, of 146.14 hectares, 78% have vegetative cover, mostly grass and a few trees, mostly exotic species such as pine and eucalyptus, which acidify the soil. The IDRD's district park system does not fulfill connectivity functions, as its design includes a greater number of hard areas like courts, tracks, and climbing walls, which do not allow for the maintenance of material and energy flows (Figueroa et al. 2016).

Neighborhood legalization

Starting in 1954, there was an increase in the number of inhabitants in the localities that form part of the study area. The settlement was primarily because its members came from the countryside and arrived in large cities to escape the war. The southern territory of Bogota allowed for their occupation, given that mining activity has been carried out for over 50 years. It could be undertaken by the peasant population accustomed to agricultural work as an operational activity. These people found an opportunity to work and obtain resources for their survival. Their settlement took place on the mountain slopes, in the rounds of rivers and streams, places classified as highly seismically vulnerable and prone to flooding, that is, in high-risk areas. The accelerated growth of the city has yet to be planned. In recent decades, public institutions have legalized substandard neighborhoods built along rivers and streams. From 1991 to 2000, the highest number of legalized neighborhoods was recorded, and from 2014 to 2019, the district administration planned to legalize 240 neighborhoods. Another component that shows the progressive deterioration of the territory due to mining activity is the precariousness in the maintenance and rehabilitation of road, pedestrian, aqueduct, and sewerage network infrastructure.

Circumstances leading to environmental problems and discrepancies among actors

The study allowed the analysis and reflection on the concepts and theories that influence environmental problems and differences of opinion among the actors involved in the exploitation of construction materials and clay in the investigated area. Circumstances leading to the worsening of the problem and discrepancies were identified, including the model adopted by the country to ensure its development, the weakness in the economy regarding national and international markets, the growing segmentation, and social inequality.

Regarding the economic model, it should be noted that since the 1990s, Colombia has implemented economic, political, and social reforms in search of development, with an unbalanced and unstable economy, both in internal and external markets. This has been evident in the low job offers, decreased investment in physical and human capital, and deficient income redistribution, which generates greater segregation in the population. Added a clientelist and weak State that has not managed to generate solutions to poverty, misery, violence, and social inequality.

These effects are the product of implementing neoliberal policies, which began with economic opening, adopting measures to reduce and remove the state from the economy, and freeing up markets, to achieve greater economic growth and sustainable development.

In this context, the components that influenced the worsening of the vulnerability and imbalance of the economy were the success of both public and private spending, the paralysis suffered by savings, the detriment of the trade balance, the increase in the price of the currency, the growth of external debt, the weakening of the financial system, and political instability. The strategies assumed regarding political agreements and controls on regulations have been manageable and have grown, unlike imports, which were suppressed in those products produced by developing countries. These were replaced, especially in the agricultural sector, a model that was developed until the Depression of 1930 (Campodónico (2008), cited by Murguía (2015)).

In that same decade of the 90s, the crisis of governability that Colombia was facing was attempted to be remedied with the issuance of the Political Constitution of 1991, which generated a social and political commitment, enshrined in fundamental rights of individual, social, economic and general nature, by modifying the relationships between different levels of government, holding regions and municipalities responsible for the efficient management of transferred fiscal resources.

The country's economy is highly vulnerable, and policies have been oriented toward economic openness. These policies establish that for the country to compete in a globalized world, it is necessary that the policies implemented reduce the state's intervention regarding production and employment, and the policy must control inflation. Under these conditions, the opportunity was created to generate competitive advantages based on technologies, through external economies and the growth of production and demand, based on productive jobs and high salaries, with the state being the driver for technological modernization and its intervention in the economy in a restricted way.

However, the results of implementing these policies have been contrary to the expected expectations, given that employment has been reduced and wages have plummeted dramatically. This has resulted in discontent, frustration, and loss of credibility among citizens, the government, and the Bank of the Republic, as the external debt and fiscal deficit policies are based on the proposals of the International Monetary Fund (IMF) and the World Bank (WB), which have not generated the expected economic growth to solve the economic and social problem that the country is going through.

The effects of the implementation of these policies show greater segregation of urban and rural populations, deterioration in the quality of life of its inhabitants, and decrease in real per capita income, which explains why purchasing power is not enough to satisfy basic needs and neither allows saving or encouraging investment through credits. Likewise, the coverage of social and economic services is weak and precarious, which produces even more economic and social destabilization. On this point, Misas (2002), cited by Martínez (2019), points out that the regional economy shows a higher concentration of income but shows trends to decrease GDP compared to countries that support their economies in the primary (agricultural) sector and the extraction of mineral resources.

The country's development model is based on mining exports and hydrocarbons, negatively impacting the national industry. This activity generates financial capital and tax collection in the short term. Still, if the resources are not distributed equitably and efficiently, they hurt the economy because it affects exchange rates, inflation, and stagnation in the agricultural and industrial sectors.

In the mid-20th century, the flagship export product in the country was coffee. The Colombian economy depended on its monetary, exchange, and fiscal policies. Given that a policy of diversifying export products was not implemented, the foreign trade policy and exchange rates were subjected to revaluation impacts reflected in good prices in times of prosperity; and fiscal and commercial crises when prices balanced out. The same happens today with coal and oil export products.

In the 90s, the boom in hydrocarbon prices surpassed coffee prices, making them the main products of economic policy. This caused the revaluation of the exchange rate and, with it, the growth of public and private spending, as well as the stagnation of the national industry, by losing competitiveness because traditional exports were put in the background and were replaced by coffee, oil, nickel, gold, and emeralds.

From 2005 to date, Colombia's top three export products are coffee, coal, and oil, which make up 52% of exports. Suppose it is intended to curb revaluation due to the amount of money entering the country. These resources should not be circulated in that case, as they would affect the exchange rate, monetary policy, and prices. If, on the contrary, the boom was referred to coffee and not to oil, the income would be distributed among a larger number of grain producers, while the mining-energy products are in the hands of few foreign investors, in the case of coal, and in the hands of the government in the case of oil.

With structural adjustments, another variable that negatively impacts is the labor market since it influences the increase in unemployment, the growing underemployment, and the precariousness of the job offer. The causes of this problem are given by the investment destined for capital-intensive mining-energy products and not for the industry, construction, and much less for agricultural sectors, resulting in unemployment and the inability to improve workers' income (Botero et al. 2015).

It is concluded that the country does not present a future of sustainable development based on the extractive exploitation of mining products, in this case, construction materials and clays, because once the reserves are depleted, there is a loss in the competitiveness of national industrial products, the country will not have suitable soils for agriculture, nor for the tourism industry. It is an opportunity for the state to implement policies of diversifying exportable products, intending to think and build a future different from mining, betting on social progress from local development (Bonilla 2011, cited by Mora and Martínez (2018)).

CONCLUSIONS

In the country, for more than 50 years, war has generated forced displacement of the population, which migrates to populated places and is located on the outskirts of large cities. This creates belts of misery and poverty in areas characterized as high risk, due to mass removal processes, or near rivers and streams, due to potential floods. This action is not accompanied by control from public institutions. In addition, neighborhoods characterized

as substandard have been built without planning criteria and have been legalized with the minimum compliance requirements established by the competent authority. The costs for the adjustments that must be made in the housing units have been covered by their owners, who develop the required adaptations, in order to access public services.

In the urban context, in Bogotá, mining activity of construction materials and clays allowed the settlement of families who saw the opportunity to get a job and, with it, some income to subsist. In the rural area (localities of Usme and Sumapaz) and in expansion-allocated lands, the population has lost confidence in public institutions due to the implementation of policies that threaten their habitat by allowing the extension of extractive activity beyond city limits. By doing so, expansion or suburban lands are invaded, resulting in greater territorial deterioration and worsening of the quality of life for its inhabitants.

In the investigative process, it was evident the development of environmental awareness in organized groups and the community in general, mainly linked to water as a vital resource. Opposition actions were observed regarding pollution, the deterioration of their territories, global warming due to the loss and extinction of flora and fauna, as well as complaints about the scarce resources that enter the administration for quarry exploitation and/or royalties, the low number of jobs generated by the sector, the environmental damages and liabilities that affect the territory and impoverish the population. All of this has allowed the use of legally constituted defense mechanisms, such as "popular consultations," in which the use of land has been reiterated according to its vocation, and rejection to city expansion due to the violation of their small and medium agricultural economies has been expressed.

The implemented methodology allowed recognizing the need for society to care for and maintain strategic ecosystems, as the deterioration or damage of these does not allow the development of vital and productive processes, losing their viability, increasing the level of risks, and accelerating discrepancies between actors that interact in the territory.

Based on society's dependency relationships with nature, institutions should implement a review of public policies regarding the functionality of strategic ecosystems, and, on the other hand, develop efficient actions for their care and preservation. This can improve the management of natural heritage and its sustainability, from policies, development plans, and private investment.

The excessive use of environmental goods and services demanded by society in relation to the available supply is unbalanced. This creates a deficit, as in the case of water, situations that become critical in some southern Bogotá localities and municipalities of the savannah. In this regard, it is important for institutions to develop the stages of planning, execution, monitoring, and evaluation (management) to foresee, correct, or improve processes. It is considered important to monitor citizens' perception of happiness in order to implement public policy decisions that generate inclusion and equity; their results will allow to demonstrate their impact. It is suggested to include in the evaluation not only investment or physical indicators, but others such as solidarity management, social support, trust, and individual and collective decision-making.

Regarding public policy instruments, such as development plans, it is important to review and analyze the possibility of generating indicators that involve qualitative aspects related to society and the environment and not just financial ones. Similarly, strategies and methodologies should be developed to monitor and evaluate the impact of policy instruments and implement preventive, corrective, and continuous improvement actions for their proper functioning. Competent institutions must generate centralized and updated geographic information systems, which allow to facilitate the development of activities, coordinate functions, generate collaborative actions between sectors, and be efficient in the use of resources, which can provide feedback on processes and decision-making.

Regarding mining properties, the implementation, evaluation, and monitoring of environmental management systems are necessary from their legal approval, serving as instruments that allow demonstrating, evaluating, and developing follow-ups to recovery and rehabilitation plans, whose objective is the reintegration into the territory of these spaces, once the extractive activity has ended based on indicators. Regarding insertion into international markets, Colombia currently depends on primary products and manufactures, which require natural resources and little technology. It is considered important to start diversification processes for products such as organic ones, which are in high demand, including canned hearts of palm, juices, concentrates, fruit pulp, panela, coffee, vegetable oils, aromatic herbs, textiles, cosmetics, extracts of medicinal plants, through fair trade and solidarity management. Regarding technological products, it is important to develop a diagnosis of the sector and implement an efficient science and technology policy that guarantees productivity and improves the quality of export products.

REFERENCES

Alier, J. (2015). La ecología política y el movimiento global de justicia ambiental. *Ecología política*, 50, 55-63. https://cutt.ly/OZp1u2P

Bassa, J., Ferrada, J., y Viera, C. (2017). La interpretación institucional de los derechos fundamentales en un Estado democrático de derecho. *Cuestiones constitucionales*, 37, 265-291. https://doi.org/10.22201/iij.24484881e.2017.37.11459

Botero, J., López, H., Ballesteros, C. y García, J. (2015). *Economía Colombiana: Análisis De Coyuntura*. Medellín, Colombia: Escuela de Economía y Finanzas, Centro de Investigaciones Económicas y Financieras, Grupo de Investigación en Estudios en Economía y Empresa, Universidad EAFIT. https://cutt.ly/MZp1IaO

Carro-Suárez, J., Sarmiento-Paredes, S. y Rosano-Ortega, G. (2017). La cultura organizacional y su influencia en la sustentabilidad empresarial. La importancia de la cultura en la sustentabilidad empresarial. *Estudios Gerenciales*, 33(145), 352-365. https://doi.org/10.1016/j.estger.2017.11.006

Comisión Económica para América Latina y el Caribe – CEPAL. (2015) Proyecciones de Población. Santiago: Naciones Unidas.

Figueroa, A., Parada, C. y Márquez, A. (2016). Producción Más Limpia: una revisión de aspectos generales. *I3+*, 3(2), 66-85. https://doi.org/10.24267/23462329.219

Hernández, B., Pérez, E., & Ramón, J. (2015). Hacia modelo educativo orientado a la protección de la salud, las actividades productivas y la conservación de sus etnias para el desarrollo sustentable con enfoque territorial. (Un estudio de caso en la etnia de los poblados de Tecoluta 1a y 2a sección perteneciente al centro integrador de Mazateupa del municipio de Nacajuca, Tabasco). En Pasado, presente y futuro de las regiones en México y su estudio. México: UNAM.

Jasso, G. y Mireles, L. (2019). Ser y deber ser de la historia ambiental ¿Pasar de la dispersión paradigmática a la revolución científica y la decolonización? *Letras Históricas,* 23, 247-275. https://cutt.ly/iZp0aGf

Juvinao, D., Ustate, L. y Camacho, F. (2020). Minería de arcilla: tecnologías, procesos y problemática ambiental en La Guajira, Colombia. *Investigación e Innovación en Ingenierías*, 8(2), 20-43. https://cutt.ly/kZp0cH5

Martínez, M. (2019). El extractivismo minero en América Latina: planteamientos, paralelismos y presunciones desde el caso de Guatemala. *Perfiles latinoamericanos*, 27(53). https://cutt.ly/uZp0StR

Montero, A., y Viales, R. (2015). La teoría del cambio en el paisaje a partir del cambio del uso de la tierra y la cobertura del suelo (enfoque lucc). Su utilidad para la historia ambiental. *Revista Reflexiones*, 94(2), 24-33. https://cutt.ly/jZp0Cyi

Mora, M., y Martínez, F. (2018). Desarrollo local sostenible, responsabilidad social corporativa y emprendimiento social. *Equidad y Desarrollo*, 31, 27-46. https://doi.org/10.19052/ed.4375

Murguía, D. (2015). Minería metalífera multinacional en Argentina: su costo de oportunidad económico-estatal y escenarios alternativos. *Revibec- Revista iberoamericana de economía ecológica*, 24, 57-70. https://cutt.ly/hZp0314

Ruiz, E. (2019) La generación de escenarios y la toma de decisiones. Cómo influye la Teoría de Juegos y el factor emocional. El caso iraní. Comunicación presentada en el Congreso Análisis de Inteligencia y Prospectiva. Grupo de Estudios en Seguridad Internacional. Universidad de Granada, Bogotá (Colombia). https://cutt.ly/mZp2ws1

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