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Evaluation of environmental aspects for the implementation of a textile company

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ABSTRACT

This article presents the qualitative evaluation of the environmental impact that would be generated by the implementation of a textile company in the Parish of Seville Don Bosco, belonging to the Morona canton, province of Morona Santiago, Ecuador. The objective of this article is to identify and evaluate the productive processes involved in textile production during the operation phase and in this way identify those activities that generate a negative impact on the environment. The methodology used to carry out this evaluation is the Importance matrix or also called the Conesa matrix. This methodology is based on the idea that the environmental impact can be measured and valued objectively. In this way an evaluation can be carried out. So that, we systematically identify impacts and prioritize actions, facilitating informed decision making. So, those activities that cause a negative impact on the environment were identified and the corresponding corrective measures were subsequently developed. The results obtained demonstrate that the activities related to the preparation of the raw material, dyeing and finishing of the fabric are associated with a severe environmental impact, because in these processes a high consumption of water is generated. In addition, a high incidence of water contamination by solids was observed as well as the use of cleaning products during the textile production process, which has negative repercussions on water quality and biodiversity, causing alterations in the water cycle and risks to human health. Therefore, it is important to highlight the importance of implementing more sustainable production practices and effective pollution control measures, for the implementation of this type of companies.

Keywords: Environmental impact, Sustainable development, Environmental cconomy, Raw material, Sustainable production, Pollution control.
Article type: Research Article.

INTRODUCTION

The qualitative assessment of the environmental impact in a textile company in the parish of Seville Don Bosco belonging to the province of Morona Santiago constitutes a topic of utmost importance in the current context of growing environmental awareness and corporate responsibility. The textile company, known for its high demand for natural resources and its potential to generate waste and pollution, faces significant challenges in the sustainable management of its operations. In this province, characterized by its natural wealth and ecological diversity, the qualitative analysis of the environmental impact of textile companies acquires even greater relevance, given the need to preserve local ecosystems

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and the well-being of surrounding communities (Martínez-Ortiz 2018). Environmental impact refers to the significant changes that an action, project or activity can cause in the environment, including ecosystems, biodiversity, natural resources and the quality of life of human communities. These impacts can be both positive and negative and can manifest themselves in various forms, such as air, water and soil pollution, landscape degradation, loss of natural habitats, species extinction, among others (Gómez Orea, 2013). This study will focus on evaluating how the activities of a textile company would affect the natural environment, water resources, air quality, biodiversity and human health in the Sevilla Don Bosco parish of the province of Morona Santiago, highlighting both the positive aspects as well as those that require attention and corrective action. Through this qualitative approach, we seek to provide a comprehensive understanding of the environmental impact of the textile company, identify areas for improvement and promote more sustainable and environmentally friendly business practices in the region. This approach seeks to contribute to the conservation of natural resources, the protection of biodiversity and the general well-being of the people in the parish of Seville Don Bosco and its surroundings.

MATERIALS AND METHODS

Geographic and environmental information

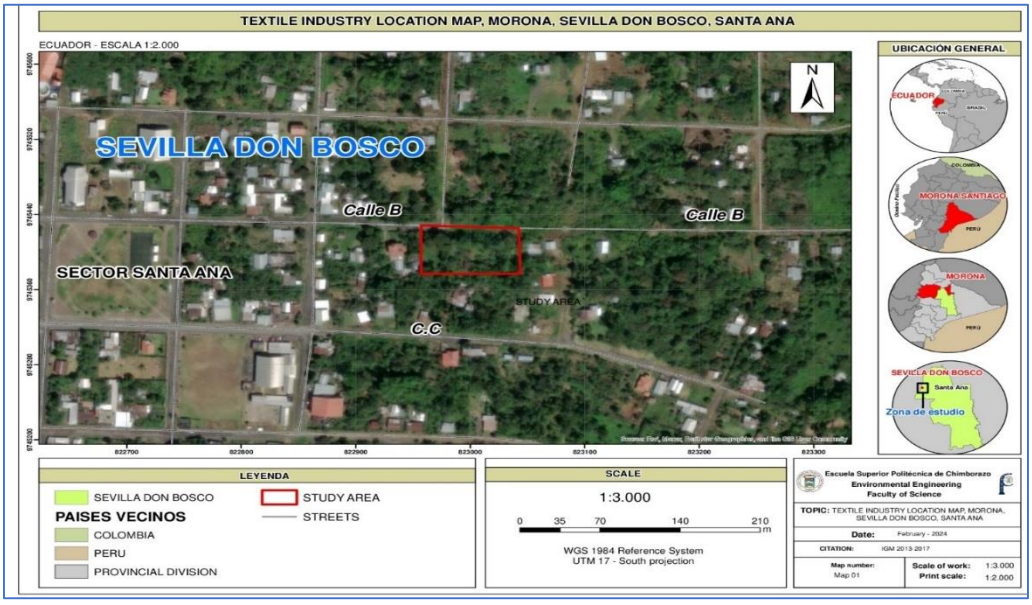

Fig. 1. Location map of the Seville Don Bosco parish.

The Sevilla Don Bosco parish is one of the nine rural parishes of the Morona canton, in the province of Morona Santiago, which was founded on the banks of the Upano River, in the Ecuadorian Amazon. This parish is located in the province of Morona Santiago, being the largest parish in the canton with an area of 2,305.44 km^2. The parish is located on the left bank of the Upano River, a plain called Upano River Valley, in front of Macas City, at the coordinates 02° 26′ south latitude and 78° 11′ west longitude, extending from 400 masl up to 2300 masl. According to INEC, in 2010, Sevilla Don Bosco had 13,413 inhabitants and projections to date could reach more than 17,000 (Suspended 2014). A little more than half of the territory (55%) are forests, of which 76.12 ha are under permanent protection, under four individual agreements with the Socio Bosque program of the Ministry of the Environment, Water and Ecological Transition (MAATE 2022). While 44.06% of the territory is grassland dedicated to raising beef and dairy cattle, an area in which agroforestry crops, agricultural mosaic, permanent and semi-permanent crops are included (MAATE 2022).

Data collection

A bibliographic review and compilation of information on the textile industries and their environmental environment were carried out. Relevant data were obtained on production processes, types of pollutants emitted, environmental control measures implemented, among others.

Identification of environmental aspects and impacts

Using the Importance matrix, the relevant environmental aspects of the activities of the textile industries were identified and their potential impacts on the environment were evaluated.

Environmental impact assessment

The Importance matrix were applied to assign qualitative values to the different environmental aspects identified, considering their magnitude, frequency, duration and reversibility. Environmental Impact Assessment (EIA) is a systematic process used to identify, predict, evaluate and mitigate the significant environmental impacts of a proposed project, plan, program or activity before it is carried out. Its main objective is to ensure that decisions related to development are made in an informed manner and adequately consider possible adverse effects on the environment and people's quality of life (Gomez 2013).

EIA involves a series of steps and procedures, which may vary depending on the context and legislation of each country, but generally include:

Identification of potential impacts. The possible environmental effects that could arise as a result of the proposed project or activity are analyzed.

Impact assessment. The identified impacts are qualitatively and quantitatively evaluated in terms of their magnitude, duration, scope and reversibility, as well as their relative importance.

Identification of alternatives. Different options or alternatives to carry out the project are explored and evaluated in order to minimize or avoid negative environmental impacts.

Mitigation and environmental management plan. Strategies and measures are developed to avoid, reduce or compensate for identified negative environmental impacts. This may include the implementation of cleaner technologies, the protection of sensitive areas, the restoration of habitats, among other actions.

Public consultation and participation. Stakeholders, including the local community and environmental organizations, are involved in the EIA process to ensure transparency, participation and consideration of their local concerns and knowledge.

Environmental viability evaluation. A comprehensive evaluation of the environmental viability of the project is carried out, considering the environmental, social, economic and cultural impacts as a whole.

Importance matrix

The Importance Matrix is used in various phases of the project development process, ranging from the planning stage to execution and monitoring. It facilitates the detection and evaluation of potential environmental effects, in addition to proposing preventive and corrective strategies aimed at reducing these impacts to a minimum. This matrix is composed of criteria as follows (Table 1).

Table 1. Qualification and assessment of environmental impacts

Criterion	Qualification	Worth
Character	Positive	(+)
	Negative	(-)
Coverage (Co)	Punctual	1
	Local	4
	Regional	8
Magnitude (*) (Mg)	Low	1
	Half	4
	High	8
Duration (Dr)	Fleeting	1
	Temporary	4
	Pertinacious	8
	Permanent	12
Resilience Or Reversibility (R.S.)	Short Term	1
	In The Medium Term	4
	Long-Term	8
	Irreversible	12
Recoverability (RE)	Short Term	1

Table 2. Importance Matrix for the assessment of environmental impacts.

Criteria		Meaning
Sign	positive (+) /negative (-)	Allusion to the beneficial (+) or harmful (-) nature of the different actions that will act on the different factors considered.
Intensity	IN	Degree of incidence of the action on the factor in the specific area in which it acts. It varies between 1 and 12, with 12 being the expression of total destruction of the factor in the area in which the effect occurs and 1 being minimal affectation.
Extension	EX	Theoretical area of influence of the impact in relation to the environment of the activity (% of area, with respect to the environment, in which the effect is manifested). If the action produces a very localized effect, the impact is considered to be punctual (1). If, on the other hand, the impact does not allow a precise location of the activity environment, having a generalized influence throughout it, the impact will be Total (8). When the effect occurs in a critical location, it will be assigned a value of four units above its corresponding value based on the % extent in which it appears.
Moment	M.O.	It refers to the time between the appearance of the action that produces the impact and the beginning of the effects on the factor considered. If the elapsed time is zero, the moment will be Immediate, and if it is less than one year, Short Term, assigning a value of four (4) in both cases. If it is a period of time greater than five years, Long Term (1).
Persistence	PE	Time that the effect will supposedly remain since its appearance and, from which the affected factor would return to the initial conditions prior to the action by natural means or by introducing corrective measures
Reversibility	VR	It refers to the possibility of reconstruction of the affected factor, that is, the possibility of returning to the initial conditions prior to the action, by natural means, once it stops acting on the environment.
Recoverability	MC	It refers to the possibility of reconstruction of the affected factor, that is, the possibility of returning to the initial conditions prior to the action, through human intervention (that is, through the implementation of environmental management measures). When the effect is irrecoverable (alteration impossible to repair, both by natural and human action) we assign the value of eight (8). If it is irrecoverable, but there is the possibility of introducing compensatory measures, the value adopted will be four (4).
Synergy	YEAH	This attribute contemplates the reinforcement of two or more simple effects. The total component of the manifestation of simple effects, caused by actions that act simultaneously, is higher than what would be expected when the actions that cause them act independently, not simultaneously.
Accumulation	A.C.	This attribute gives an idea of the progressive increase in the manifestation of the effect when the action that generates it persists continuously or repeatedly. When an action does not produce cumulative effects (simple accumulation), the effect is valued as one (1); If the effect produced is cumulative, the value increases to four (4).
Effect	EF	This attribute refers to the cause-effect relationship, that is, to the form of manifestation of the effect on a factor, as a consequence of an action. It can be direct or primary, in this case the repercussion of the action being a direct consequence of it, or indirect or secondary, when the manifestation is not a direct consequence of the action, but rather takes place from a primary effect, this acting as a second order action.
Periodicity	PR	It refers to the regularity of manifestation of the effect, whether cyclical or recurring (periodic effect), unpredictable over time (irregular effect) or constant over time (continuous effect).

Positive impacts

Unimportant Hits: Hits with an Importance Value less than +25.

Important Hits: Hits with an Importance Value between +25 and +50.

Very Important Hits: Hits with an Importance Value greater than +50.

Prioritization of environmental impacts

The prioritization of environmental impacts is carried out based on the combination of the following criteria:

Legal requirements and other provisions (RLO). refers to the inability to comply with the legal regulations, legal requirements and policy commitments of the organization.

Environmental management (EMM). considers the current existence of environmental management measures.

Technical-economic benefits (BTE) – "Eco-efficiency". refers to the possibility of obtaining economic resources by converting waste (atmospheric emissions, liquid effluents, solid waste) into marketable by-products. Likewise, saving materials or energy while avoiding environmental impact.

Environmental importance (AI): corresponds to the degree of criticality of the Environmental Importance previously evaluated.

Table 3. Ranges for calculating environmental importance.

Criteria/Range	Qualif.	Criteria/Range	Qualif.
Nature		**Intensity (In)**	
Beneficial Impact	+	Low	1
Detrimental Impact	-	Half	2
		High	4
		Very High	8
		Total	12
Extension (Ex)		**Moment (Mo)**	
Punctual	1	Long Term	1
Partial	2	Medium Term	2
Extensive	4	Immediate	4
Total	8	Critical	(+4)
Criticism	(+4)		
Persistence (Pe)		**Reversibility (Rv)**	
Fleeting	1	Short Term	1
Temporary	2	Medium Term	2
Permanent	4	Irreversible	4
Synergy (Yes)		**Accumulation (Ac)**	
Without synergism (Simple)	1	Simple	1
Synergistic	2	Cumulative	4
Very synergistic	4		
Effect (Ef)		**Periodicity (Pr)**	
Indirect	1	Irregular/Aperiodic/Continuous	1
Straight	4	Newspaper	2
		Continuous	4
Recoverability (Mc)		**Importance (I)**	
Immediate recoverable	1		
Recoverable in the medium term	2	I= (3in+2ex+Mo+Pe+Rv+Si+Ac+Ef+Pr+Mc)	
Mitigable or compensable	4		
Irrecoverable	8		

Table 4. Scores for impact classification.

	Negative Character		Meaning
Importance (Yo)	Irrelevant	<-25	It is irrelevant or compatible with the environment compared to the importance of carrying out the activities in question.
	Moderate	-25 to <-50	It does not require intensive corrective or mitigating measures.
	Severe	-50 TO -75	It requires the recovery of environmental conditions through the prolonged use of mitigating and/or corrective measures.
	Critical	>-75	The impact is greater than the acceptable threshold. A permanent loss of quality occurs in environmental conditions. There is NO possibility of recovery whatsoever.
	Positive Character		
Importance (Yo)	Less Important	<+25	
	Important	+25 TO +50	
	Very Important	>+50	

Negative impacts

Irrelevant Impacts: Impacts with an Importance Value less than -25.

Moderate Impacts: Impacts with an Importance Value between -25 and less than -50.
Severe Impacts: Impacts with an Importance Value between -50 and -75.
Critical Hits: Hits with an Importance Value greater than -75.

Table 5. Criteria for prioritizing environmental impacts.

Criterion	Range	Assessment	Explanation
Legal and other requirements (RLO)		5	It is regulated and the provisions are not complied with
		4	It is not regulated and there is no impact management
		3	Partial non-compliance with legal regulations and other requirements.
		2	It is not regulated, but there is harmonious management.
		1	It is regulated and legal and other requirements are met.
Environmental Management (MMA)	Bad	5	There is no control over appearance or impact.
	Regular	3	Control exists, but it is poor
	Well	1	There is control and it is effective
Technical-Economic Benefits (Eco-efficiency) (BTE)	Low	5	There are no economic benefits and waste is generated.
	Half	3	Economic benefits are produced by saving materials, energy or obtaining by-products, but waste is still generated.
	high	1	Economic benefits are produced by saving materials, energy or obtaining byproducts instead of waste.

Table 6. Significance criteria of environmental impact.

Significance Level	Worth	Action To Take
Critical	Over 55	Immediate, urgent care or with economic benefits
Very Significant	41-55	Immediate and careful attention
Significant	26-40	Low-cost careful care
Little Significant	11-25	Maintain current management with low investments
Not Significant	1-10	Monitoring and maintenance of management

RESULTS AND DISCUSSION

Below, the results obtained when applying the matrix with the CONESA method in the qualitative evaluation for a Textile Industry in the Sevilla Don Bosco parish are described.

Description of the production process

Odor emission. Dyeing in the textile industry has several significant environmental impacts, including water consumption and pollution, intensive energy use, atmospheric emissions and waste generation. Corrective measures that textile industries can implement are: cleaner and more efficient dyeing technologies, as well as environmental management practices that reduce the consumption of natural resources and minimize the generation of waste and pollutants.

Environmental noise generated by machinery. Environmental noise generated by machinery in the textile industry can have various environmental and human health impacts, including health problems, disturbance in the quality of life of the community, impact on fauna, regulatory compliance, and job security. Corrective measures may include implementing noise control measures, such as installing noise barriers, using hearing protection equipment for workers, and adopting quieter technologies. Additionally, proper plant layout and landscape planning can help minimize the spread of noise to surrounding areas.

Water pollution by solids. water pollution by solids in the textile industry affects the environment in several aspects, including the alteration of aquatic ecosystems, the obstruction of water bodies, the contamination of water quality and the risk to human health. Corrective measures for this will be: implementing more efficient wastewater management practices, advanced wastewater treatment technologies and water conservation measures.

Use of cleaning products. The use of cleaning products in the textile industry generates several environmental impacts including water and air pollution, waste generation, health risks and the impact on biodiversity. One of the corrective measures that textile companies can apply is to choose to use safer and more ecological cleaning products, implement more sustainable chemical management practices and promote the efficient use of natural resources.

Soil pollution from solid waste. Soil pollution from solid waste in the textile industry produces adverse environmental, social and economic impacts, including soil degradation, contamination of water resources, loss of biodiversity, risks to human health, the decrease in aesthetic and tourist value, and the costs of cleaning and remediation.

Table 7. Importance Matrix of a Textile Industry.

Activity	Component	Environmental aspect	Impact	NAT	IN	EX	M.O.	PE	VR	YEAH	A.C.	EF	PR	MC	Importance	Impact
Reception and storage of raw materials	Air	Deterioration of air quality	odor emissions	Negative (-)	2	2	2	2	2	2	4	4	4	2	**32**	Moderate
Transport		Atmospheric emissions	Environmental noise generated by machinery	Negative (-)	2	2	2	2	2	2	4	4	4	4	**3. 4**	Moderate
Raw material preparation	Water	Water consumption	Water contamination by solids	Negative (-)	8	4	4	2	2	2	4	4	4	4	**58**	Severe
Fabric dyeing and finishing		Affectation due to the use of chemical products	Use of cleaning products	Negative (-)	8	4	4	2	2	2	4	4	4	4	**58**	Severe
Textile finishing	Floor	Soil damage	Soil contamination by solid waste	Negative (-)	4	2	2	2	2	2	4	4	4	4	**40**	Moderate
Machinery maintenance	Water	Water consumption	Water contamination	Negative (-)	4	2	4	2	2	2	4	4	2	4	**40**	Moderate
Storage	Floor	Energy consumption	Soil contamination by solid waste	Negative (-)	1	1	2	2	1	1	1	1	2	1	**16**	Irrelevant

To correct these impacts, it is crucial to adopt more efficient solid waste management practices, implement pollution prevention measures and promote the circular economy in the textile industry.

Soil contamination by solid waste. In this activity, the storage of finished products in the textile industry is carried out. On the contrary, this activity generates an irrelevant or compatible impact with the environment, which is why it is not necessary to implement any corrective measure.

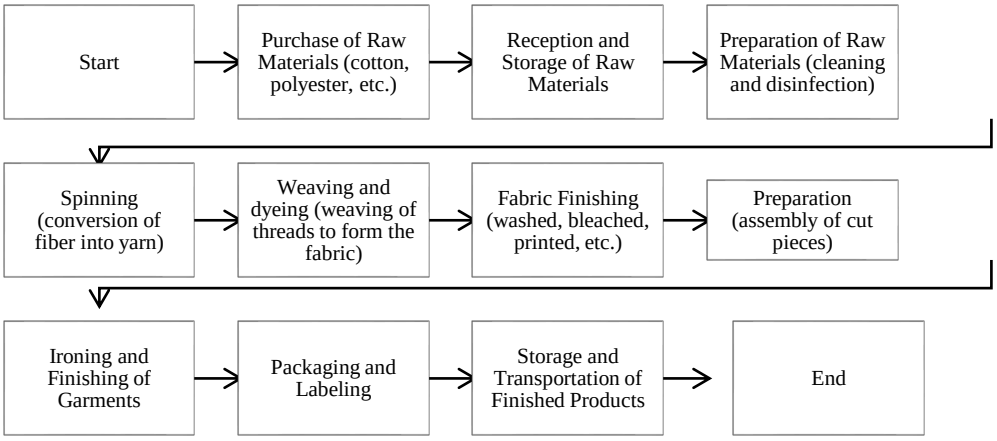

Fig. 2. Flow diagram of the production process in textile production.

DISCUSSION

After applying the qualitative evaluation using the Conesa matrix, the results reveal that the activities of raw material preparation, dyeing and finishing of the fabric in the textile production processes are associated with a severe negative environmental impact, therefore that the recovery of environmental conditions is required through the prolonged use of mitigating and/or corrective measures, especially with regard to water contamination by solids and the use of cleaning products in textile production (Torres 2010; Vivar Arrieta *et al.* 2023; Uralovich *et al.* 2023; Sadiq *et al*. 2024; Xu *et al.* 2024). The textile industry is known for its high consumption of natural resources, such as water and energy, as well as its intensive use of raw materials. In Seville Don Bosco Parish, where resources may be limited, it is crucial to evaluate how these activities affect the availability and quality of local natural resources (Pabón 2014; INC 2015; Chandramowleeswaran *et al.* 2023; Davidson & Ugwoha 2024). Production processes in the textile industry can generate air emissions and wastewater discharges containing chemicals and dyes. This can have a significant impact on air and water quality in the Parish, as well as the health of local residents and aquatic life, and exposure to chemicals and particles emitted by the textile industry may pose a risk to the health of people living near the facilities (Benavides Rivera, 2015). However, the textile industry can have a large impact on the local economy and contribute to economic development, and can provide a number of tangible and intangible benefits to a surrounding community, including job creation, economic stimulus, skills development, investment in infrastructure, community support and economic diversification. However, it is important that these companies operate in a responsible and sustainable manner, minimizing negative impacts on the environment and the community, while maximizing social and economic benefits, otherwise there may be negative effects, such as competition for resources. natural, possible changes in the landscape and culture of the community (Torres, 2010).

CONSLUSIONS

In conclusion, the qualitative assessment using the importance matrix of the environmental impact that the Implementation of a textile industry would have in the Don Bosco Parish of Seville is a fundamental process to understand and address the environmental effects of the operations of this industry in the local community. By using this evaluation tool, it has been possible to systematically identify and analyze possible aspects of environmental impact, such as air, water and soil pollution, as well as the generation of waste and the consumption of natural resources. The importance matrix served to identify those activities that generate negative impacts, such as the preparation of raw materials, dyeing and finishing of the fabric that are associated with a severe negative environmental impact, especially with regard to pollution. of water for solids and the use of cleaning products in textile production. This qualitative assessment provides a baseline for decision-making, and the implementation of possible corrective or mitigation measures, to allow adequate responsible environmental management. By understanding the specific impacts that the implementation of a textile industry would have in the Don Bosco

Parish of Seville, companies, local authorities and the community in general can work together to develop strategies and actions that minimize negative effects and promote a sustainable development.

REFERENCES

Benavides Rivera, V 2015, Design of the environmental management plan for the textile industry Aritex de Colombia SA. Obtained from: https://red.uao.edu.co/bitstream/handle/10614/7875/T05873.pdf;sequence=1

Chandramowleeswaran, G, Alzubaidi, LH, Liz, AS, Khare, N, Khurramov, A & Baswaraju, S 2023, Design of financing strategy model of financial management based on data mining technology. In *2023 Second International Conference On Smart Technologies for Smart Nation (SmartTechCon)*, pp. 1179-1183. IEEE.

Davidson, DE & Ugwoha, E 2024, Impact of occupational noise on the circulatory system of workers in a typical floating production vessel. *International Journal of Innovations in Engineering Research and Technology*, 11: 30-37. https://doi.org/10.26662/ijiert.v11i1.pp30-37

Gomez Orea, D 2013 Environmental impact assessment. Mundi-Prensa Editions. Obtained from:https://books.google.es/books?hl=es&lr=&id=9VOuAwAAQBAJ&oi=fnd&pg=PA15&dq=evaluaci%C3%B3n+de+impacto+ambiental&ots=PR1foQssqe&sig=HPtLdI4uqQTeBVeG6hn7kWwzafg

Gómez, U 2013 Simulation model for the production process in textile manufacturing companies. Obtained from: https://biblioteca.icesi.edu.co/revistas/index.php/sistemas_telematica/article/view/1503/0

Google Earth 2023, Obtained from: https://earth.google.es/

INC 2015, Procedure for identification of aspects, assessment and control of impacts. Obtained from: https://www.inci.gov.co/sites/default/files/transparenciaok/3-estructura-organica/332019/3320198/PROCEDimiento%20IDENTIFICACION%20DE%20ASPECTOS%2C%20VALORACION%20Y%20CONTROL%20DE %20IMPACTOS.doc#:~:text=Impacts%20Moderate%3A%20Impacts %20with%20 Value ,of%2

MAATE 2022, Ministry of the environment, water and ecological transition. obtained from: https://www.ambiente.gob.ec/ministerio-del-ambiente-presento-los-resultados-del-convenio-interinstitucional-suscribed-con-pueblos-y-nacionalidades-de-la-amazonia-ecuatoriana /

Pabón, M 2014, Environmental impact assessment Conesa Matrix. Retrieved from: https://repository.usta.edu.co/bitstream/handle/11634/18964/2019julianamoreno4.pdf?sequence=10

Sadiq, M, Paramaiah, C, Dong, Z, Nawaz, MA & Shukurullaevich, NK 2024, Role of fintech, green finance, and natural resource rents in sustainable climate change in China. Mediating role of environmental regulations and government interventions in the pre-post COVID eras. *Resources Policy*, 88: 104494.

Suspended, A 2014, General characteristics of the Seville Don Bosco parish. Obtained from: https://sevilladonbosco.gob.ec/caracteristicas-generales-de-la-parroquia/

Torres, C 2010, Ex-post environmental impact study for the textile industry of the Pelileo Canton-province of Tungurahua-Ecuador Obtained from: http://www. conama11. vsf. en/conama10/download/files/conama11/CT, 202010, 186699893

Uralovich, KS, Toshmamatovich, TU, Kubayevich, KF, Sapaev, I, Saylaubaevna, SS, Beknazarova, Z, Khurramov, A 2023, 'A primary factor in sustainable development and environmental sustainability is environmental education, *Caspian Journal of Environmental Sciences*, 21: 965-975. doi: 10.22124/cjes.2023.7155

Vivar Arrieta, MA, Haro Altamirano, JP, Carrillo Barahona, WE, López Sampedro, SE, Usmanovich, B A, Usmonov, B & Ulugbek kizi, MS 2023, Multicriteria evaluation of ancestral family agricultural systems, Chimborazo Province, Ecuador. *Caspian Journal of Environmental Sciences*, 21: 1123-1134. doi: 10.22124/cjes.2023.7400

Xu, P, Adebayo, TS, Khan, KA, Özkan, O & Shukurullaevich, K 2024, United States' 2050 carbon neutrality: Myth or reality? Evaluating the impact of high-tech industries and green electricity consumption. *Journal of Cleaner Production*, 140855.

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Barahona, WEC, Ruiz, CDJ, Vargas, VMT, Saigua, JHL, Abdurashidovich, UA, Abduraimovna, IO, Farrux, Q, Alimullaevna, NF, Khasanov, BA, Golibjon, A, Khurramova, MMQ 2024, Evaluation of environmental aspects for the implementation of a textile company. Caspian Journal of Environmental Sciences, 22: 443-451.