

**Methodological Proposal for the Assessment of Company Sustainability in
Transport Logistics**

Alexandre Chacon Fernandes

Master's student in Environmental Sciences, UB, Brazil.
alechaconf@gmail.com

Evandro Roberto Tagliaferro

PhD Professor, UB, Brazil.
Evandro.tagliaferro@universidadebrasil.edu.br

Luiz Sergio Vanzela

PhD Professor, UB, Brazil.
Luiz.vanzela@ub.edu.br

ABSTRACT

The sustainability of companies is a principle that is increasingly defining their development and growth, with the valuation of the market and products and services, having the principles of the United Nations Global Compact as the guidelines for achieving sustainability. In the case of a logistics for a transportation company, it is necessary to carry out a diagnosis of performance to then establish an action plan that aims at its sustainability, called Sustainable Plan for Transport Logistics (SPTL). Therefore, the objective of this work was to develop a methodology for the diagnosis, allowing the company to classify its sustainability and guide it in the elaboration of the action plan in the short, medium and long term of the SPTL. The principle was to develop an objective method to classify the level of sustainability of a company based on a final score, determined by means of parameters modified from the principles of the UN Global Compact, called "principles of sustainability". The method was then applied to a transportation company located in the Northeast of São Paulo. We conclude that the proposed method allowed us to classify the company's sustainability as moderate, as well as to identify the points that need action to achieve full sustainability, acting with respect to the principles of human rights and labor, environment and anti-corruption.

KEYWORDS: ESG. Global Compact. Sustainability.

1 INTRODUCTION

One of the most strategic and important sectors for countries and the world, which strongly influence socioeconomic development and directly impact the environment, is the transport sector. In Brazil, according to Parisi (2021), five modes of transport are used, namely: air, road, water, rail and pipeline, road being responsible for 62% of transport operations in Brazil.

The significant concentration of transport in a single mode, for Colavite and Konishi (2015), demonstrates the need for greater investments in infrastructure in the diversification and improvement of the various modes, with emphasis on rail and waterway. The same authors also state that even with a majority composition in the road modal, it needs investments in improving its paving, implementation and operations.

According to Soliani and Argoud (2015), the emission of polluting gases by the road freight transport process entails significant environmental impacts, demanding attention and the constant search for alternatives for its reduction. There are several elements emitted by burning Diesel (such as soot, carbon monoxide and hydrocarbons) that contaminate the air and atmosphere, constituting factors that are harmful to the health of living beings and cause the greenhouse effect (GHE).

If the road modal will be for some time or definitively the majority modal of the Brazilian cargo transport, new forms of management must be implemented by the companies in order to provide sustainability in the sector. The Ministry of Infrastructure itself (2022) states that the objective of the National Plan for Transport Logistics - NPTL is to formalize and perpetuate analysis instruments, from the perspective of logistics, to support the planning of public and private interventions in infrastructure and organization of transport, so that the sector can effectively contribute to achieving the country's economic, social and ecological goals, in the medium to long term horizons, aiming at sustainable development.

In this context, transport companies could manage their activities with the help of sustainability plans for transport logistics companies (SPTL). This would constitute a plan of actions to be implemented in the short, medium and long term, aiming at sustainability in its performance in society, integrating the company's growth with the minimization of environmental

impacts and the contribution to socioeconomic development.

However, the definition of the action plan requires an initial diagnosis stage of the company in relation to its sustainable performance, which could be guided by the principles of the United Nations Global Compact (UN, 2014), whose foundation is based on its performance in relation to human and labor rights, the environment and anti-corruption. An example is the ESG (Environmental, Social and Governance) which can be characterized as environmental, social and governance factors that are the basis for measuring the sustainable performance of companies (TRIPATHI; BHANDARI, 2014).

Thus, considering the need for transport logistics companies to manage their activities based on a SPTL, the objective of this work was to create a methodology for the diagnosis stage, allowing the classification of the company's sustainability and guide it in the elaboration of the plan of shares in the short, medium and long term of the SPTL.

2. OBJECTIVES

2.1. General objective

The objective of this work was the development of methodology to classify the sustainability of companies and guide it in the elaboration of Sustainable Transport Logistics Plans (PSLT).

2.2. Specific objectives

Knowing the complexity of national logistics and its greatness, and thus the difficulty of companies as to their understanding in their classification as sustainable, we understand that actions are executions of the company outside its scope of business, the actions said herein refer to the auxiliary actions of primary operations, such as financial, administrative, internal and commercial services, and when we refer to operations we say to the company's primary actions, such as storage and transportation, the specific objectives in this work will have to:

- Study actions and operations of the company, thus understanding all its actions and operations, attitudes towards the principles of the UN Global Compact;
- Verify in these actions and operations which already have the idealization regarding the objectives related to or similar to the principles of the Global Compact;
- Analyze in the company's actions and operations what adaptations are necessary to better **classify it** with a sustainable level, and which actions and operations are already executed at sustainable levels;
- Identify in these actions and operations possible changes or implementations to **initially** classify its current situation and thus suggest changes or implementations different from those already practiced, so that these make the company can increase its level of classification as sustainability;
- Document the company's actions and operations inherent to the principles of the Global Compact and verify which ones already have a sustainable objective, and suggest changes or implementations, adapting as much as possible their actions and operations in a better sustainability classification.

3. METODOLOGY

The methodological proposal for the diagnosis of the companies was of their own development, however, based on the ten principles of the UN global compact (UN, 2014), derived from the following documents: Universal Declaration of Human Rights, Declaration of the International Labor Organization on Principles and Fundamental Rights at Work, Rio Declaration on Environment and Development and United Nations Convention against Corruption.

The principle was to develop an objective method for classifying the level of sustainability of a company based on a score (final score). The final score, in turn, is determined by means of scores obtained from parameters modified from the principles of the UN global compact. As the methodology was based on the principles of the UN compact, however, with modifications, the methodology came to be called simply “sustainability principles”.

After developing the methodology, its practical evaluation was carried out in a transport company located in a municipality in the Northwest of São Paulo State, whose data collection was carried out by observation in loco, in a visit carried out in all sectors of the company, on May 31, 2022, with the authorization of the legal representative. For this, a field notes form was used, contemplating the evaluation criteria based on the principles of sustainability. Public information on the website was also used.

For ethical reasons, the company was not identified, in accordance with item VII of Article 1 of resolution n. 510/2016 of the Ministry of Health (2016), which does not require registration with CONEP for “research that aims at the theoretical deepening of situations that emerge spontaneously and contingently in professional practice, provided that they do not reveal data that can identify the subject”.

4. RESULTS

4.1. Diagnosis of the sustainability of a transport logistics company

The methodology for classifying the sustainability of the company's transport logistics involves classification based on the final score, as shown in Table 1.

Table 1 - Transport logistics sustainability classification.

Final score (f _s)	Transport logistics
0 a 250	Non-existent sustainability
251 a 500	Low sustainability
501 a 750	Moderate sustainability
751 a 1000	Sustainable

The final score, which takes into account the scores of an adaptation of the principles of the UN global compact, is determined by Equation 01.

$$f_s = hrl_s + e_s + ac_s \tag{Equation 01}$$

, where:

f_s – final score;

hrl_s - “human rights and labor” principle score (Table 2);

e_s – “environment” principle score (Table 2);

ac_s - “anti-corruption” principle score (Tabela 2).

Table 2 – How to calculate the score of the principles adapted from the UN Global Compact.

Principle	Equation	Evaluated parameters
Human rights and labor	$hrl_s = hrl_{s1} + hrl_{s2}$	hrl_{s1} - score for the parameter “Protection of human rights and labor”; hrl_{s2} - score for the parameter “Abuses of human rights and labor”.
Environment	$e_s = e_{s1} + e_{s2} + e_{s3}$	e_{s1} - score of the parameter “Preventive actions to environmental challenges”; e_{s2} - score for the parameter “Environmental responsibility initiatives”; e_{s3} - score for the parameter “Stimulus to the development and diffusion of environmentally friendly technologies”.
Anti-corruption	$ac_s = ac_{s1}$	ac_{s1} - score of the parameter “Actions to combat corruption”.

The scores of the parameters evaluated in each principle of the global compact are determined by the generic expression of Equation 02.

$$s_u = 100 \left(\frac{\sum g_u w_u}{max_g} \right)$$

Equation 02

, where:

S_u - score of parameter “u”;

Sg_u – sum of grades awarded according to the level of adherence or compliance with parameter “u” of sustainability principle (Table 3);

max_g - maximum grade that can be assigned for the level of adherence or compliance with parameter “u” of the sustainability principle (Table 4);

w_u - weight of the importance of parameter “u” for the principle of sustainability (Table 4).

It can be seen (Table 3) that the grades awarded range from 0 (zero) to 5 (five) based on criteria that consider the integration of compliance with rules/legislation related to each sustainability principle and the company's proactive actions in relation to sustainability.

Table 3 - Scores attributed (g_u) according to the level of adherence or compliance and weight of the importance of the parameters of the sustainability principles.

g_u	Grade assignment criteria
0	It does not comply with the laws/norms regarding the sustainability principle parameter
1	It partially complies with laws/norms regarding the sustainability principle parameter
2	It complies only with what is required by the laws/norms regarding the parameter of the principle of sustainability
3	In addition to complying with legal requirements/norms, it carries out informal improvement actions in relation to the parameter of the sustainability principle
4	In addition to complying with legal requirements/norms, it has official policies (published within the organization) for improvements in relation to the parameter of the principle of sustainability
5	In addition to complying with legal requirements, it has improvement policies (published within the organization) and a system to monitor its execution and disclose results in relation to the parameter of the principle of sustainability

For each sustainability principle, several evaluation parameters were defined and the application of a note according to Table 3, allowing, from equation 02, to determine the score of the sustainability principle. Also, weights were assigned to each sustainability principle, according to the importance considered in the company's sustainability.

The principle of "1. Human rights and labor (hrl_s)" can reach a maximum score of 100 and a score of 300, because its total weight is 3.0. The principle of "2. Environment (e_s)" can reach a maximum score of 75 and a score of 500, because its total weight is 5.0. And finally, the principle "3. Anticorruption (ac_s)" can reach a maximum score of 20 and a score of 200, because its total weight is 2.0. In this way, the final score can reach a maximum of 1000, classifying the company, in general, as sustainable.

The method also allows evaluating the company's performance according to the principle of sustainability (example: if the principle "2. Environment (e_s)" reached a score of 250, it is inferred that the company complies with 50% of the sustainability parameters). And since scores (from 0 to 5) are assigned to the individual parameters (for example, the principle "2. Environment (e_s)" has a total of 15 parameters from item 2.1.1. to item 2.3.6.), it is possible a diagnosis that points out where the company still needs to improve in terms of sustainability, facilitating the diagnosis and planning of future actions to improve this specific point.

By incorporating the principles of the Global Compact into strategies, policies and procedures, and establishing a culture of integrity, according to UN (2014), companies are not only fulfilling their basic responsibilities towards people and the planet, but also setting the stage for long-term success.

Table 4 - Maximum grade (max_g) that can be assigned to the level of adherence or compliance and weight (w_u) of the importance of the parameters of the sustainability principles.

Principle	max_g	w_u
1. Human rights and labor (hrl_s)		
1.1. Protection of human rights and labor (hrl1 _s)		
1.1.1. Working conditions (safe and healthy); 1.1.2. Discrimination at work; 1.1.3. Forced or child labor; 1.1.4. Concern with workers' health, housing and education; 1.1.5. Inclusion/hiring of victims of violence; 1.1.6. Respect for union membership by workers; 1.1.7. Respect for different religious practices; 1.1.8. Concern about the forced displacement of people; 1.1.9. Economic contribution to the local community; 1.1.10. Integration/debate with the local community; 1.1.11. Availability of the company's service to access by the poorest; 1.1.12. Opportunity for women in the community; 1.1.13. Relationship between the services offered by the company in improving the most vulnerable; and 1.1.14. Use of force in company security.	70	2,0
1.2. Human rights abuses (hrl2 _s)		
1.2.1. Knowledge about the companies you do business with, in relation to abuses; 1.2.2. Policies to protect the human rights of its employees; 1.2.3. Monitoring whether your workers have their human rights respected; 1.2.4. Company maintains human rights dialogue/project with society groups; 1.2.5. It has policies to prevent security actions that violate human rights; and 1.2.6. It considers possible impacts on human rights in terminating business relationships	30	1,0
2. Environment (e_s)		
2.1. Preventive actions for environmental challenges (e1 _s)		
2.1.1. It maintains production codes/practices with minimization of damage to health or the environment; 2.1.2. It has a committee/system for overseeing risks to health or the environment; 2.1.3. It provides economic support for research or sustainable actions; and 2.1.4. Collaborative participation in sharing knowledge and experience on sustainability actions	20	2,0
2.2. Environmental responsibility initiatives (e2 _s)		
2.2.1. It has the company's vision, policies and strategies, including sustainable development; 2.2.2. It develops sustainability goals and indicators (economic, environmental, social); 2.2.3. It has a sustainable production and consumption program; 2.2.4. It works with product designers and suppliers that improve environmental performance; and 2.2.5. Monitoring progress in incorporating sustainability principles into business practices	25	2,0
2.3. Encouraging the development and dissemination of environmentally friendly technologies (e3 _s)		
2.3.1. It maintains the company's corporate or individual policy on the use of environmentally sustainable technologies; 2.3.2. It provides information on environmental performance and the benefits of using sustainable technologies; 2.3.3. It has a life cycle assessment system for new technologies and products; 2.3.4. It has an environmental technology assessment program; 2.3.5. It establishes investment and policy criteria for suppliers and contractors, guaranteeing minimum environmental criteria; and 2.3.6. It cooperates with industry partners to spread the best technology to other organizations	30	1,0
3. Anti-corruption (ac_s)		
3.1. Actions to combat corruption (ac1 _s)		
3.1.1. It has anti-corruption policies and programs in its organizations and its business operations; 3.1.2. It maintains monitoring of anti-corruption progress; 3.1.3. It joins forces with industry companies and other stakeholders in anti-corruption efforts (to level the playing field and create fair competition for all); 3.1.4. It signs the "Anti-Corruption Call to Action" (business document to governments to fight corruption and promote effective governance for a sustainable and inclusive global economy))	20	2,0

4.2. Application of the method

The application of the proposed diagnostic method was carried out in a transport logistics company located in the municipality of Fernandópolis - SP, which operates in the transport of dry loads in general, fractional or complete. The company still has 05 branches, 04 of which are located in the interior of the State of São Paulo and 01 in the Capital.

Based on data collected during an on-site visit authorized by the owner and through research on the company's website, carrying out a survey of all the evaluation parameters, applying the grades and then determining the scores of the sustainability principles, the result is in Table 5.

Table 5 - General summary of the results of the scores (s_u) determined for each sustainability principle

Human rights and labor	w_u	\max_g	Σg_u	s_u
1. Human rights and labor (hrl_s)				
1.1. Protection of human rights and labor	2	70	42	120
1.2. Abuses of human rights	1	30	9	30
Subtotal 1.				150
2. Environment (e_s)				
2.1. Preventive actions for environmental challenges	2	20	18	180
2.2. Environmental responsibility initiatives	2	25	14	112
2.3. Encouraging the development and dissemination of eco-friendly technologies	1	30	12	40
Subtotal 2.				332
3. Anticorruption (ac_s)				
3.1. Actions to fight corruption	2	20	5	50
Subtotal 3.				50
Total				532

The result of the diagnosis based on the proposed method resulted in a final score of $f_s = 532$, considering that the evaluated company has a general performance classified as moderately sustainable (according to Table 1).

Evaluating the scores of the sustainability principles in isolation, it was observed that the company complied with 50% of the principle "1. Human rights and work" (it obtained 150 out of a maximum of 300), 66% met the principle "2. Environment" (it obtained 332 out of a maximum of 500) and 25% of the principle "3. Anti-Corruption" (scored 50 out of a maximum of 200).

Therefore, according to the proposed method, for the company to reach the classification of sustainable company, it needs to propose actions for the parameters "3.1.1. It has anti-corruption policies and programs in its organizations and its business operations, 3.1.2. It

maintains monitoring of anti-corruption progress and 3.1.4. It signs the “Anti-Corruption Call to Action” of the principle of “3. Anti-corruption”.

At the beginning “1. Human rights and labor” must propose actions for the parameters “1.1.1. Working conditions (safe and healthy), 1.1.6. It respects union membership by workers, 1.1.7. It respects different religious practices, 1.1.13. Relationship between the services offered by the company in improving the most vulnerable, 1.1.14. Use of force in company security, 1.2.1. Knowledge about the companies with which it does business, in relation to abuses, 1.2.2. Policies to protect the human rights of its employees, 1.2.3. Monitoring whether its workers have their human rights respected and 1.2.4. The company maintains a human rights dialogue/project with society groups”.

At the beginning “2. Environment” needs to propose actions for the parameters “2.2.2. Develop sustainability goals and indicators (economic, environmental, social), 2.2.3. It has a sustainable production and consumption program, 2.2.4. It works with product designers and suppliers that improve environmental performance, 2.3.1. It maintains corporate or individual company policy on the use of environmentally sustainable technologies, 2.3.2. It provides information on environmental performance and the benefits of using sustainable technologies, 2.3.3. It has a life cycle assessment system for new technologies and products and 2.3.4. It has an environmental technology assessment program”.

And at the beginning “3. Anticorruption” needs to propose actions for parameters “3.1.1. Creation and application of the company's values, making everyone aware of this practice”.

The diagnoses should provide references for planning actions, as already obtained by Zamcopéa, Ensslinb and Ensslin (2012). The authors developed a corporate sustainability assessment model for a textile industry and concluded that the model identified the need to create a sustainability committee, review strategic planning, strengthen communication channels with stakeholders and awareness programs for employees, suppliers and other people involved.

According to the Global Compact Brazil Network (2021), through research carried out with its participants, it was observed that most respondents revealed that they were encouraged with high frequency to rethink and create solutions that positively impact the 3 ESG criteria: 51% of respondents are always encouraged to consider practices with more positive social impacts; 50% for more positive environmental impacts and 48% for more positive governance impacts.

This scenario demonstrates the importance of developing practical and objective methodologies for diagnosing the performance of companies, generating reliable information that serves as a reference for the development of short, medium and long-term action plans to achieve sustainability.

5. CONCLUSION

The proposed method allowed classifying the company's sustainability as moderate, as well as identifying the points that need actions to achieve full sustainability, acting with respect for the principles of human rights and labor, environment and anti-corruption.

6. REFERENCES

BLACKBURN, Alexander. Et. al. **Glossary for Transport Statistics**. 5TH EDITION. 2019. International Transport Forum, United Nations. Eurostat. *M a n u a l s a n d Guidelines*. 2019.

COLAVITE, Alessandro Serrano; KONISHI, Fabio. **A matriz do transporte no Brasil: uma análise comparativa para a competitividade**. In: SIMPÓSIO DE EXCELÊNCIA EM GESTÃO E TECNOLOGIA, OUT 2015, Rio de Janeiro. **Anais [...]**. Rio de Janeiro: Associação Educacional Dom Bosco, 2015. P. 3.

HALBRITTER, Gerhard; Dorfleitner, Gregor. The wages of social responsibility — where are they? A critical review of ESG investing. **Review of Financial Economics**, University of Regensburg, Department of Finance, Regensburg, Germany. mar. 2015. , Department of Finance. P. 4.

MAGALHÃES, Marcos Thadeu Queiroz; ARAGÃO, Joaquim José Guilherme de; YAMASHITA, Yaeko. Definição de transporte: **Uma reflexão sobre a natureza do fenômeno e objeto da pesquisa e ensino em transportes**. v. 22 n. 3 (2014). Acesso em: 10 jul. 2022.

MINISTÉRIO DA INFRAESTRUTURA. **Plano Nacional de Logística e Transportes – PNLT**. Disponível em: <<https://www.gov.br/infraestrutura/pt-br/assuntos/transporte-terrestre/plano-nacional-de-logistica-e-transportes>>. Acesso em 15 jul. 2022.

PACTO GLOBAL E STILINGUE. **A evolução do ESG no Brasil. abr. 2021**. Pacto Global – Rede Brasil. Disponível em: <<https://www.pactoglobal.org.br/10-principios>> Acesso 12 jul. 2022.

PARISI, Leonardo; **INFRAESTRUTURA DE TRANSPORTES E O IMPACTO SOCIOECONÔMICO CAUSADO NO BRASI**; UNIVERSIDADE ESTADUAL PAULISTA “JÚLIO DE MESQUITA FILHO” FACULDADE DE ENGENHARIA CÂMPUS DE ILHA SOLTEIRA - UNESP, 2021. p. 15.

PLENÁRIO DO CONSELHO NACIONAL DE SAÚDE. **RESOLUÇÃO Nº 510, DE 07 DE ABRIL DE 2016**. Direito à informação e à autonomia do participante de pesquisas. Disponível em: <<http://conselho.saude.gov.br/resolucoes/2016/Reso510.pdf>>

SILVA, Rafael Felix da; FILHO, Edelvino Razzolini; **O PAPEL DA INFORMAÇÃO SOBRE SUSTENTABILIDADE NOS PROCESSOS DE TOMADA DE DECISÃO**. Revista Metropolitana de Sustentabilidade. Volume 11, número 1. jan. / abr. 2021. P. 107-109.

SOLIANI, R.D; ARGOU, A.R.T.T. **A emissão de gases poluentes no transporte rodoviário de cargas brasileiro**. Revista Espacios. Vol. 39 (nº 48). Pág. 14. Ano 2018.

ZAMCOPÉ, Fábio Cristiano. et. al. **Desenvolvimento de um modelo para avaliar a sustentabilidade corporativa**. Disponível em: <<https://www.scielo.br/j/prod/a/sKShs6dXwsHt5nxrvrmswpm/?lang=pt#>> Acesso em 15 jul. 2022.

ZIONI, Silvana; FREITAS, Simone Rodrigues de; **Aspectos ambientais no Plano Nacional de Logística e Transporte do Brasil**; Sistema eletrônico de Revista; Universidade Federal do ABC (UFABC). Vol. 35, dez. 2015.