Real Estate Production in Contaminated Areas and its Contribution to the 2030 Agenda: Perception of Experts for the City of São Paulo

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ABSTRACT

Among the various challenges of urbanization, the relationship between environmental impacts and the difficulty of meeting the expansive demand for housing and commerce stands out. In this last aspect, the real estate sector's interest in making properties with industrial history suitable for residential or commercial use is highlighted. This interest comes up against, however, the damage caused by industrial contamination. In the municipality of São Paulo and the metropolitan region, this is a reality that is well known by the real estate sector. Therefore, the potential of Management of Contaminated Area (GAC) in providing opportunities to the real estate market is highlighted. Along with revitalization, GAC can collaborate with the quality of life in metropolises, one of the main urban sustainability goals established by the United Nations 2030 Agenda. In this sense, the objective of this work was to analyze the benefits and challenges of contaminated areas for the real estate production sector in the city of São Paulo, relating these aspects to sustainable development. The perception of nine specialists from the public and private sectors was analyzed through semi-structured interviews. The remediation and decontamination of areas impacted by industrial activities promote the revitalization of areas, increasing the availability of properties with safe use and contributing to society. The benefits of investing in contaminated areas, performed by categorization of feelings, showed that 100% of respondents have a positive feeling. The interpretation of the experts' responses regarding the risks of investing in contaminated areas, carried out by categorization of feelings, showed that 100% of respondents had a negative feeling. In the experts' perception, several benefits of the GAC were identified aimed at urban sustainability and a lack of knowledge regarding the contributions of management to the SDGs and the 2030 Agenda goals. Despite this assessment, the responses allowed diagnosing six SDGs in which the revitalization and remediation of contaminated areas play a central role: SDG 3, 4, 11, 12 and 13.

KEYWORDS: Contaminated areas. Real estate market. Construction. Sustainable Development Goals. Sustainability.

1. INTRODUCTION

The accelerated growth of cities is a phenomenon of global attention. Among several challenges, the environmental impacts aggravated by industrialization are associated with the difficulty of meeting the expanding demand for housing and commerce. The poorly planned industrial advance and population growth provoke the disorderly agglomeration of the urban space that, from the 20th century onwards, suffers from an insufficient supply of land (FURTADO, 2019). In this scenario, it is worth noting the interest of the real estate sector in making properties with industrial history suitable for residential or commercial use. As these properties are vacated, due to the various factors that lead to the process of deindustrialization, real estate speculation is boosted, which makes new habitable areas possible (PADUA, 2008).

Despite the great potential for reuse, land with a history of industrial use has a serious barrier in most cases: soil and groundwater contamination. Contamination is defined by Chapman (2007 p. 492, our translation) as substances present where they would not normally occur, or in concentrations above the natural environment. In many of the areas unoccupied by deindustrialization, contaminating residues left by productive activity remain, generating environmental liabilities.

In these cases, actions called Management of Contaminated Areas (GAC) are required. The GAC is an environmental management process involving the stages of investigation, remediation and rehabilitation of properties (CETESB, 2022). It involves quantitative control regarding the risks associated with human health and environmental components (ecological risk), and the application of technologies related to the Remediation of Contaminated Areas (RAC) (reference). Thus, the treatment of these contaminated areas, through technologies related to RAC, can allow the rehabilitation of contaminated properties, achieving improvements in urban occupation (GÜNTHER and RISSO 2006; NASCIMENTO et al., 2022). This process has the potential to respond to the fundamental demands of large urban centers, especially in scenarios of urbanization as unequal as those that exist in Brazil. In this sense, it is

possible to emphasize the issues experienced in the city of São Paulo, which is the largest Brazilian metropolis, with an estimated population of 12,396,372 inhabitants in the year 2020 (IBGE, 2022) and is still the city with the highest industrial development of all Latin America (SUZIGAN, 2000).

In the city of São Paulo, the main challenges related to the use of the GAC by the real estate sector to make land available are accentuated. Currently, in the municipality, the scarcity of areas for construction has overvalued the few remaining areas, generating a more competitive market and more concentrated on inhabitants with greater purchasing power (JANKAVSKI, 2022; GUIMARÃES, 2012). The heterogeneous development of the city compromises the access of the poorest classes, in addition to being these parts of society most affected by the incidence of environmental liabilities.

By intervening in favor of safer housing and better urban infrastructure for future residents of metropolises, GAC and RAC technologies begin to deal, centrally, with the issue of urban sustainability. According to the World Commission on Environment and Development, also known as the Brundtland Commission, sustainable development concerns the "progressive economic transformation of the economy and society" that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (SECRETARY-GENERAL; DEVELOPMENT, 1987, p. 54, our translation). In this sense, urban sustainability consists, centrally, in the equitable, effective and participatory management of benefits that respond to these needs in the daily lives of cities (UN, 2015, p. 21).

In the aspect of sustainability, at a global level, the Sustainable Development Goals (SDGs) stipulated in the Global Action Plan of the United Nations (UN), named by the UN, in 2015, as the 2030 Agenda, stand out. establishment of common objectives and goals to be implemented by each UN member country in a joint action plan to promote sustainability, prosperity and diversity on the planet (UN, 2015). The SDGs are becoming increasingly important in global politics as they articulate environmental, social and economic issues, therefore acting on the principles of ESG (Environmental, Social and Governance). Urban sustainability gained specific focus from the United Nations with SDG 11 - Sustainable Cities and Communities (UN, 2015, p. 21) and with the Habitat III Agenda (UN, 2017).

Several scholars have already addressed the interest of the real estate production sector in properties with an industrial history (MELLO, 2019; MORINGA, 2013; PINTO and BRUNA, 2020). However, in contexts such as Brazil, the sustainable remediation of contaminated spaces remains an incipient issue. Compared to developed countries, developing countries, such as Brazil, have paid little attention to the topic (BRAUN et al., 2020).

Considering this scenario, the present work addresses the participation of the GAC in the revitalization of spaces made available to real estate production, with the aim of investigating the relationship of these measures with the promotion of urban sustainability. With attention to gaps in the subject, the article addresses the following research question: what are the potential benefits and challenges of using contaminated areas for real estate production and the contributions of this use to the 2030 Agenda?

2. OBJETIVE

To analyze the potential benefits and challenges of using contaminated areas for real estate production and their contributions to the 2030 Agenda.

3. METODOLOGY OF THE RESEARCH

The research is characterized as a descriptive and exploratory study, which consisted of analyzing the perception of experts in the real estate market and the public sector in the city of São Paulo, related to the areas of civil construction and contaminated areas. For this purpose, two main steps were performed: data collection and data analysis. Next, the stages of the research methodology adopted will be described in detail.

3.1 Data collection

For data collection, a summary chart of the script directed by the specific objectives of this work was prepared (Chart 1). Data were collected through: (a) documentary research, (b) informal conversations with professionals in the real estate market and environmental consultancy, and (c) semi-structured interviews with specialists from the public and private sectors. To this end, information was collected from secondary data sources (documentary survey and bibliographical research) and primary sources (interviews), based on the method by Marconi and Lakatos (2004).

Table 1- Relationship between the specific objectives and the guiding script of the research.

Section	Specific objectives	Script (Research questions to be answered)
Real estate market	Analyze the real estate market in the city of São Paulo	1. What is the real estate market?[1]
		2. How correct is its correlation with real estate production and city construction?[1]
		3. What are the agents involved? [1]
		4. What is the scenario in Brazil? [1]
		5. What is the scene in São Paulo? [1]
		6. What are the problems associated with the real estate market in São Paulo? [1]
Contaminated areas	Understanding the origins of contaminated areas	7. How do contaminated areas arise? [1]
		8. How did the environmental concern related to contaminated areas arise? [1]
		9. What is the current scenario of contaminated areas in São Paulo? [1]
		10. What is the legal system surrounding the contaminated areas? [1]
Real Estate Market and its correction with contaminated areas	Investigate the perception of experts on the benefits, risks, challenges and barriers	11. What is the perception of experts on real estate investment[2]
SDG	Verify contributions from the real estate production sector in contaminated areas to the SDGs of the 2030 Agenda	12. What are the possible targets correlated to the real estate market and contaminated areas according to experts? [1]

Legend: [1]Document research: secondary source; [2]Interviews: primary source.
Source: Authors, 2023.

3.1.1. Documentary Research

The documentary research method provided the search for documents and diverse and dispersed sources, which provided essential information and knowledge for the development of the research. In this sense, it sought information in official documents, statistical tables, reports

(FONSECA, 2002). In this research, the mapped documents were from public archives, found on CETESB, UN and UN-Habitat websites.

3.1.2. Informal Conversations

Informal conversations were held with professionals from the real estate market and environmental consultants, with the purpose of preparing a script of questions for the interviews with the specialists. From these conversations came the indication of the first stakeholders for the interview. The interview script (Chart 2), consisting of 12 questions, was adapted from the work of Viana (2019). Thus, the objective was to analyze the perception of specialists in relation to investments in the real estate production sector in contaminated areas.

Chart 2 – Questions from the structured script applied to the interviewed stakeholders.

QUESTIONS
1. What is the current investment scenario in the real estate market in contaminated areas in São Paulo?
2. What are the benefits of investments in contaminated areas for the real estate sector?
3. What are the risks of investments in contaminated areas for the real estate sector?
4. What are the main challenges found in contaminated areas for the real estate sector?
5. In your opinion, what are the obstacles in the process of managing contaminated areas for the real estate sector?
6. In your perception, what would be the benefits of the real estate production process for the public sector?
7. In your perception, what would be the benefits of the real estate production process for the private sector?
8. In your opinion, what would be the expected scenario for investments in the real estate market in contaminated areas for the next 5 or 10 years?
9. In your opinion, do investments in areas contaminated by the real estate sector contribute to urban sustainability?
10. In your opinion, do investments in areas contaminated by the real estate sector contribute to improving the quality of life, health and human well-being?
11. Is the UN's 2030 Agenda considered in the real estate sector? If yes, how?
12. Could you refer me to someone who could tell me more about real estate, contaminated land and sustainability?

Source: Authors, 2023

3.1.3. Interviews

The interviews were conducted based on the Vergara method (2009), which consists of exploring various points of interest in depth with the interviewees, combining an exploratory and descriptive interview. The interviews were semi-structured, but allowed the spontaneity and freedom necessary to reach new perspectives for the investigation, developed based on the snowball method of Biermackie and Waldorf (1981). As a premise of the interview, he undertook to ensure the privacy and confidentiality of the data used. Therefore, interviewees are referred to only by alphanumeric identification: "E1", "E2", "E3"; up to "E9", making a total of nine respondents. Figure 1 summarizes this interview process in a flowchart.

Figure 1 - Experts interviewed from the public and private sectors using the snowball method.
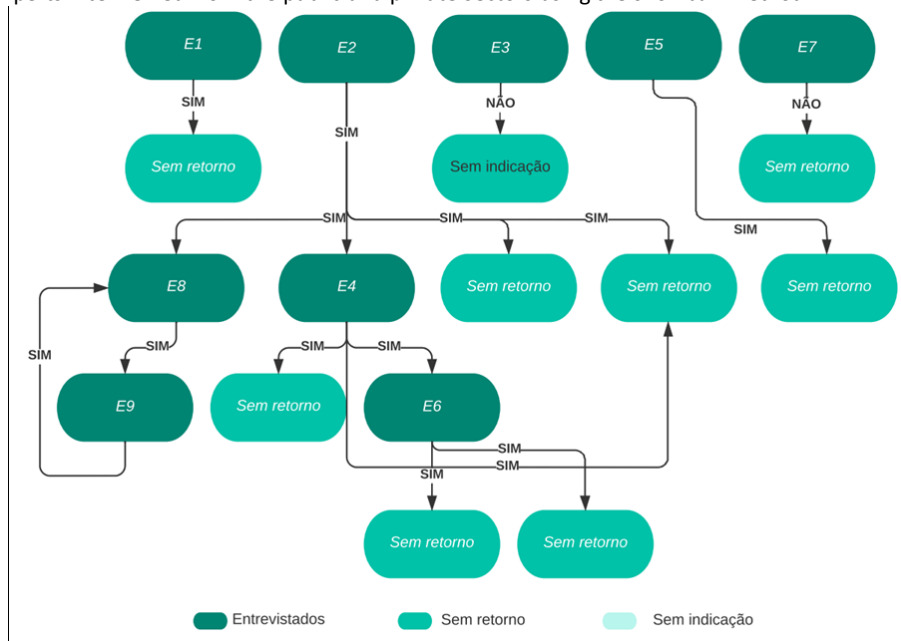
Source: Authors, 2022.

The profile of the interviewees is composed of: Engineer (E5), Consultant (E4), Managers (E1, E3, E6 and E9), Directors (E7 and E8) and Partner (E2), which are technical, management and leadership positions . In addition, of the nine interviewees, six work in the private sector (E1, E2, E3, E4, E6 and E7) and three work in the public sector (E5, E8 and E9). From the private sector, two are from the environmental consulting area (E4 and E6) and four are from the real estate sector (E1, E2, E3 and E7). All interviewees from the public sector work at the Environmental Company of the State of São Paulo - CETESB. The length of experience of each interviewee ranged from 10 to 41 years.

3.2.   Data analysis

For analysis and discussion of the collected data, the step-by-step content analysis proposed by Nascimento et al. (2021): (i) interviews were transcribed verbatim; (ii), the data collected underwent pre-analysis, which established a relationship between the question asked, potential problem related to the research and the response collected in the interview; (iii) proceeded with data exploration, which consisted of in-depth analysis of the collected data, categorizing each response (codes), and, finally, (iv) interpretation of results, relating them to the reference theoretical.

It urges to elucidate that the exploration of the data consisted, in turn, of two categorizations: (i) sentiment analysis - "Positive, Neutral or Negative" -, using the commercial software Atlas.ti for this purpose, and (ii) codes selected by the research author. The sentiment analysis used by the Atlas.ti software used linguistic analysis techniques to identify sentiments attributed to words or phrases that express emotions or feelings (joy, validation, certainty, doubt, anger, frustration, etc.). The selected codes took into account, among other aspects, the concepts and variables concerning the field of contaminated areas and their contribution to the research problem, that is, it was up to the authors to be subjective and at the same time try to interpret the meaning of the answer, not only the words used, summarized in keywords, taking

into account, among other aspects, the concepts and variables addressed in the documentary research.

Figure 2 – Data Analysis Process.
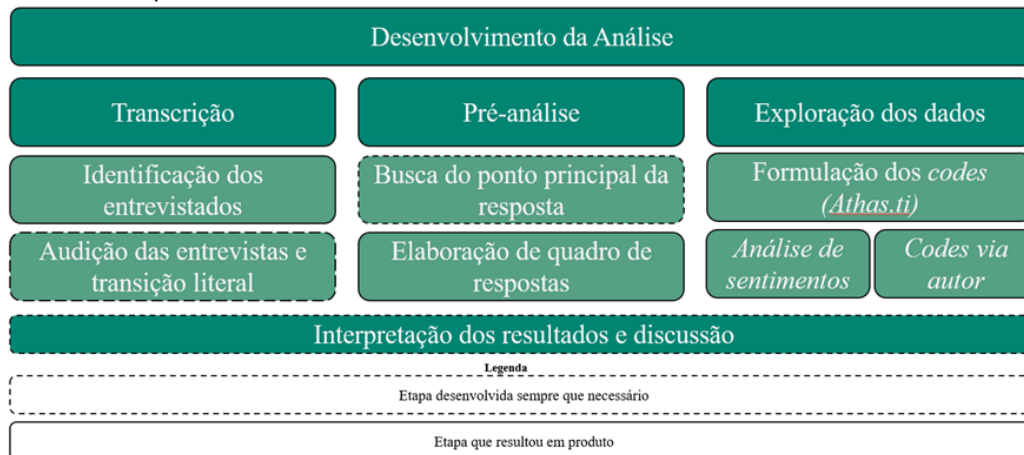
Source: Authors, 2023.

4. RESULTS

4.1. Experts' Perception Regarding Investments in Contaminated Areas

First, an attempt was made to understand the experts' view of the GAC's current conditions. Therefore, there was an analysis of the interviewees' responses regarding the current scenario of real estate investments in contaminated areas. Among public sector experts, perceptions were quite divergent. For the E5, investors are focusing their efforts on less complex cases, with low potential to have a significant environmental liability. Interviewee E8 understands that the current scenario is a new reality, because in order to promote the change of use and occupation of a property, it is essential to act in these areas, reinforced by the fact that there is a shortage of non-contaminated properties in the Metropolitan Region of São Paulo (RMSP).

In contrast, among interviewees from the private sector (E1, E2, E3, E4 and E6), most believe that the investment scenario is good, high heated, with many opportunities for new prospects. This factor is in accordance with what was pointed out by AQEEL (2014) and VAN STRAALEN (2002), since the past expansion of industries, and the consequent formation of urban areas around industrial activity, is the driver of several sources of waste emission (AQEEL et al., 2014; VAN STRAALEN, 2002), and its treatment and decontamination are intrinsically connected with real estate development. It should be remembered that Brazilian legislation is mandatory with regard to the management of contaminated areas, and analysis and approval by CETESB become a requirement for the installation and license of new ventures (REIS, 2021). Only E7 believes it to be a restricted market, as, according to him, few investors target this market. In the words of interviewee E7: "Actually, what remains of land in São Paulo is what is contaminated. So there are very few investors who look at this market as an opportunity."

The interpretation of the experts' responses regarding the investment scenario in contaminated areas, carried out by categorization of feelings, showed that 44.44% of

respondents had a Positive feeling (E1, E2, E6 and E8), 44.44% as Neutral (E3 , E4, E5 and E9) and 11.11% as Negative (E7). The response categorization evaluated by the author verified questions related to opportunity (E1, E3, E4, E5, E6), scarcity (E2 and E8), reality (E8), restricted (E7) and uncertain (E9).

Despite the differences, the interviewees were able to list several benefits linked to investments in contaminated areas, citing dimensions such as: financial gains, return to the population and environmental revitalization itself. Interviewees from the public sector reported benefits related to the financial issue, that is, being able to buy land cheaper than usual (E5, E9), offering a safer product to the population (E8) and revitalization and reuse itself (E9). The benefits most cited by private sector respondents are the revitalization and reuse of areas (E2, E3, E4, E6), followed by improvements identified in their surroundings (E7), whose main beneficiary, according to E1, is the population itself.

In this sense, the experts' perception covers a wide range of potential benefits. The remediation and decontamination of areas previously impacted by past activities, mostly industrial activities (E1, E2), end up promoting the revitalization of areas, increasing the availability of properties with safe use, contributing to society (E1, E2, E6, E9), given that the government would not be able to solve this problem (E2, E3). They also promote the improvement of water quality, whether rivers, streams or even aquifers (E2), which can contribute to urban sustainability (E6).

The interpretation of the experts' answers about the benefits of investing in contaminated areas, carried out by categorization of feelings, showed that 100% of the interviewees had a positive feeling (E1, E2, E3, E4, E5, E6, E7, E8 and E9). The response categorization showed issues related to undertake (E1 and E2), revitalization (E3), reuse (E4, E6, E9), economy (E5), economic viability (E4, E5), financial viability (E4, E5), sustainability (E6), security (E8), feasibility (E7) and opportunity (E9).

With regard to the risks of investing in contaminated areas, there is a greater convergence of responses among interviewees from the public and private sectors. This alignment is observed in the questions: technical (E1, E4, E5, E8 and E9), legal (E1, E3, E4, E5, E6), economic (E2, E3, E7, E8), human health (E2, E3, E7, E8) risks (E6), delays (E6 and E7) and image (E6 and E7). Research work carried out with inaccurate, erroneous diagnoses, with a lack of qualified labor, without a well-defined intervention plan, mean that remediation projects are unable to achieve the objectives and estimated deadlines, promoting the issue of technical insecurity (poorly qualified environmental consultants and consultants) to real estate specialists (E4, E5, E6, E8 and E9). Due to these issues, experts claim that the sector ends up fleeing complex and large contaminated areas, as they have risks associated with exposure in the media, in a negative way, and may, in addition, draw the attention of the Public Ministry (E3, E5, E7) .

The interpretation of the experts' responses regarding the risks of investing in contaminated areas, carried out by categorization of feelings, showed that 100% of the interviewees had a negative feeling (E1, E2, E3, E4, E5, E6, E7, E8 and E9). The response categorization showed questions related to environmental risk (E1), technical risk (E1, E4, E5, E6, E8 and E9), legal risk (E1, E3, E4 and E5), economic risk (E2, E3, E7 and E8), delays (E2, E6 and E7), human health risk (E6), image risk (E6 and E7). It is important to point out that legal risk is also called "legal uncertainty" in real estate development (HAAS and MOREIRA, 2014).

Another factor in which perceptions tend to converge is the assessment of challenges concerning investments in contaminated areas. The perception of public sector experts (E5, E8

and E9) converges on challenges related to technical responsibility, such as obtaining a concise diagnosis and suitable professionals for proposals for safe conditions for the intended use. These issues are in line with the perception of experts in the private sector (E3, E7), who address the market's challenge of finding adequate and safe technical solutions to reduce the deadlines for studies and rehabilitation of the property.

The challenges, therefore, boil down to the difficulty of having an adequate diagnosis before becoming a legal guardian. Once this responsibility is established, the agent assumes all legal risks associated with that area. This factor is in line with the main challenge highlighted by E8: finding good professionals to obtain a more assertive and safe environmental diagnosis.

The interpretation of the experts' answers regarding the challenges, performed by categorization of feelings, showed that 77.77% of the interviewees had a Neutral feeling (E1, E2, E3, E4, E7, E8 and E9), 11.11% Negative (E6) and 11.11% Positive (E6). The response categorization showed questions related to costs (E1, E6), accidents (E2), technical responsibility (E3, E7, E8), deadline (E3, E4, E6, E7), public power (E4), decision makers (E5) and communication (E9). Even though they see risks and challenges in common, experts from the public and private sectors differ as to the practical obstacles caused by these problems, as the public sector consulted here is focused on inspection and the private sector is focused on profit/business issues.

Interviewees from the public sector (E5, E8 and E9) understand that the barriers are associated with the quality of the environmental studies delivered to the bodies, which sometimes present faulty diagnoses, which may cause the processes analyzed to be rejected. With regard to experts from the private sector, most (E3, E4, E6 and E7) consider administrative, regulatory and process analysis issues as barriers. One of the experts (E7), even without delving into the subject, drew attention to the issue of corruption. Therefore, bureaucratic (E2), administrative (E3) and regulatory (E3, E6, E7) obstacles, for experts in the private sector, collaborate with the delay in the analysis of processes by environmental agencies, in this case CETESB, in line with the slowness of the public sector to carry out the environmental assessment addressed by Ramires and Ribeiro (2021). However, according to experts from the environmental agencies, what is considered an obstacle is, in reality, the technical quality of the studies presented to them, that is, the technical reports prepared and delivered for analysis by the environmental agencies.

The interpretation of the experts' answers, carried out by categorization of feelings, showed that 55.55% of the interviewees had a negative feeling (E2, E3, E4, E5, E7), 33.33% Neutral (E1, E6, E9) and 11.11% Positive (E8). The categorization of responses related to obstacles presented questions related to cost (E1), bureaucracy (E2), administrative (E3), deadline (E3 and E4), regulation (E3, E6 and E7), corruption (E7), conscience (E8), technical responsibility (E5 and E9). In this sense, the perception of the specific benefits brought to each sector – public and private – was analyzed. All experts believe there are benefits for the public sector. Among the benefits, the following were mentioned: meeting the housing demand (E4); infrastructure improvements (E3); revitalization of areas and their surroundings (E2, E3, E5 and E9), which occur at an increasing speed (E5); recovery of orphaned and abandoned areas (E6 and E8), and tax collection (E7). Based on the answers, it is evident that the real estate sector has been acting in the process of acquiring contaminated areas and acting strongly in the change of use, through private capital.

The interpretation of the experts' answers about the benefits to the public sector, carried out by categorization of feelings, showed that 100% of the interviewees had a Positive feeling (E1, E2, E3, E4, E5, E6, E7, E8 and E9), 00, 00% Neutral and 00.00% Negative. The categorization of responses related to benefits for the public sector verified issues related to investment (E1), counterparts (E2 and E3), housing demand (E4), reuse (E5, E6 and E9), taxes (E7), loan (E8). Finally, with regard to investments in contaminated areas, let us analyze the projections presented by specialists.

In the interviews, the interviewees' perception of the investment scenarios for the next 5 or 10 years was addressed. Among public sector experts (E5, E8 and E9), there is strong divergence. For E5 the scenario is unsafe, for E8 it is promising, for E9 it is uncertain. Unlike the perception of the private sector (E1, E2, E3, E4, E6 and E7), for which the scenario is characterized as good, immense, optimistic and promising.

The interpretation of the experts' answers about the benefits to the private sector, carried out by categorization of feelings, showed that 100% of the interviewees had a Positive feeling (E1, E2, E3, E4, E5, E6, E7, E8 and E9), 00, 00% Neutral and 00.00% Negative. The categorization of responses related to the benefits for the private sector were: valuation (E1), Employment (E2), Taxes (E2), Infrastructure (E3), Social impact (E3), Business (E4, E5, E6, E7, E8 and E9). Finally, with regard to investments in contaminated areas, let us analyze the projections presented by experts. In the interviews, the interviewees' perception of the investment scenarios for the next 5 or 10 years was addressed. Among public sector experts (E5, E8 and E9), there is great divergence. For E5 the scenario is unsafe, for E8 it is promising, for E9 it is uncertain. Unlike the perception of the private sector (E1, E2, E3, E4, E6 and E7), for which the scenario is characterized as good, immense, optimistic and promising.

Due to the housing deficit, E3 understands that there is a lot of room for action in the real estate sector, and consequently investments and selection of contaminated and degraded areas. As mentioned by E2, E4 and E8, this activity is necessary, as it is part of the reuse process: if you don't remedy it, you don't undertake it. Currently, there is legal (disagreed by expert E5) and technical certainty, which makes the growth of this type of market feasible.

The interpretation of the experts' responses regarding the future scenario, carried out by categorization of feelings, showed that 77.77% of the interviewees had a Positive feeling (E1, E2, E3, E4, E6, E7 and E8), 11.11% Neutral (E9) and 11.11% Negative (E5). The categorization of answers related to the scenario for the next 5 or 10 years verified questions related to being promising (E1, E2, E6, E8), optimistic (E3), active (E4), legal uncertainty (E5), good (E7) and uncertain (E9).

4.2. Experts' Perception of the Relationship between Investments and Sustainability

In general, both the perception of experts in the public sector and that of the private sector confirms that investments in the real estate sector in contaminated areas have been contributing to urban sustainability.

Disagreeing with this perception, E5, from the public sector, points out that the issue of sustainability depends a lot on the point of view: it helps with revitalization, but perhaps it does not have the same impact during the RAC. The perception of E7, from the private sector, points out that the benefit is not something deliberate: the investor is concerned with solving

his property problem or tries to fit in with the new changes in the market, such as the emergence of the ESG, and, just for that reason , ends up contributing minimally.

Comparing the responses of all experts, it is possible to verify that there is a contribution to sustainability, and that this contribution is due to the fact that the remediation process ends up promoting the cleaning of areas at risk. As environmental damage is repaired in a given area, the availability of housing for society increases, which contributes to the well-being of the current population, as well as to greater housing opportunities in the future. In addition, the expansion of housing can reduce people's mobility time, favoring both the quality and accessibility of transport systems, as described in SDG 11 of the 2030 Agenda, and the reduction of carbon emissions.

The interpretation of the experts' answers regarding the contribution of the management of contaminated areas to sustainability, carried out by categorization of feelings, showed that 77.77% of respondents had a Positive feeling (E1, E2, E3, E4, E6, E8 and E9) , 22.22% Neutral (E5 and E7) and 00.00% Negative. The categorization of responses related to obstacles verified issues related to reuse (E1, E6, E9), social (E2, E6), social benefit (E3), infrastructure (E3, E6), human health (E4), uncertain (E5) , opportunity (E7), need E8).

So, in what aspects do such advances in urban sustainability impact the daily life of the population? When questioned whether investment in contaminated areas promotes better quality of life, health and human well-being, most experts in the public sector (E8 and E9) and all in the private sector pointed out that investments in contaminated areas contribute to these factors. On the other hand, E5 argues that the returns on these investments end up in the hands of a few [entrepreneurs] and that the real benefits are not absorbed by all residents.

However, most experts (E1, E4, E6, E7, E8, E9) converge on the perception exemplified by E3:

> the extent to which you have an investment in a contaminated area, you have the rehabilitation of that area, you develop housing units [...] So, you take that family, that citizen, from a slightly more precarious housing, without any kind of infrastructure, without any benefit from a welfare point of view. Put him there in a condominium that in the medium and long term will start to receive other types of infrastructure [...]

E3 highlighted the role of real estate development segments, such as "*Minha Casa, Minha Vida*", which provide families with housing opportunities with better infrastructure. In this sense, new ventures attract new businesses, jobs, transportation and public safety, all of which are indicative of improving the quality of life. This perception is in line with Diaz Sarachaga et al. (2017), who exemplifies that sustainability in developing countries requires a delicate balance between social, economic and environmental factors, where, specifically in this case, the economic-social dimensions can overcome environmental concerns. As previously explored, cities, especially large metropolises, stand out in the conjunction of these different dimensions.

The interpretation of the experts' answers regarding the improvements generated by the investment in contaminated areas, carried out by categorization of feelings, showed that 88.88% of the interviewees had a Positive feeling (E1, E2, E3, E4, E6, E7, E8 and E9), 11.11 % Neutral (E5) and 00.00% Negative. The categorization of responses related to the perception of improved quality of life, health and human well-being verified questions related to well-being (E1), contributes (E2 and E8), development (E3 and E7), quality of life (E4), health (E4, E6), uncertain (E5), transport (E6), environment (E6) and incentives (E9).

Finally, it was analyzed how experts evaluate these contributions and improvements to the SDGs of the 2030 Agenda.

The answers from the private sector experts focused on: lack of knowledge about the 2030 Agenda (E2, E6, E7, E9), heard about it, but do not know exactly about the subject (E5), do not have confidence to answer (E8) and finally , believe that the real estate sector does not consider the 2030 Agenda (E4). However, E1 reported perceiving a more sustainable movement in the real estate sector, especially in publicly traded companies, which was confirmed by E3, who, unlike all interviewees, knows and applies some issues in the 2030 Agenda in the company in which it operates . Interviewees E1 and E3 work in real estate development. E3 commented on SDG 4 (Quality Education) giving as an example the investments aimed at social problems in education that its bonding company carries out.

E3 also linked the issue of sustainability with the ESG movement that is on the rise in the market, but stressed that associating sustainability issues with GAC is another step that still needs to be matured. The fact is that builders and developers that are trying to enter the publicly traded market need to fit in with the movement driven by the ESG, which ends up encompassing some challenges of the 2030 Agenda. 2030 updated or seeks improvement with these issues related to the SDGs, mainly related to SDG 11. Although this movement is being just to fit in with the "requirements" of the market, there may be a gain for companies to adhere to the 2030 Agenda.

The interpretation of the experts' responses on the SDGs, carried out by categorization of feelings, showed that 11.11% of respondents had a Positive feeling (E3), 33.33% Neutral (E3, E4 and E8) and 55.55% Negative (E2, E5, E6, E7 and E9). The categorization of answers related to whether the UN's 2030 Agenda is considered in the real estate sector presented the following words: uncertain (E1, E2, E4, E5, E6, E7, E8 and E9), opportunity, open capital and business (E3).

From these analyses, it can be observed that the GAC experts, despite differing on some points concerning their areas of action, recognize a series of aspects where investment in contaminated areas is related to sustainability. The benefits to the population, revealing the social importance of real estate speculation from the GAC; the risks and challenges linked to environmental management, with emphasis on legal uncertainty; as well as the reuse measures necessary for the future scenario to be prosperous, are just some of the factors where real estate investment in contaminated areas is directly related to efforts to revitalize the natural environment in favor of the adequate availability of housing in cities.

The general perception is that the practical effort to adjust GAC measures to the SDG remains sporadic and in the minority. Therefore, a table of potential benefits of the GAC to sustainability, and even of sustainable development to the prospects for the future of the GAC, but which little translates into measures to pursue the 2030 Agenda, and thus consolidate this potential into well-structured and globally recognized goals . The contribution of investment in contaminated areas to the quality of life, health and human well-being is possible, it occurs in practice, but remains, in general, unstructured and contingent.

However, despite this situation, few experts are able to connect the sustainable aspects of the GAC with the goals of the 2030 Agenda. Although there is some demand from the market to adapt real estate production to the SDGs, lack of knowledge, a negative view and uncertainty still prevail among experts. with regard to this Agenda.

4.3 Consolidating Objectives: a diagnosis of the SDGs

The analysis of the interviews showed that real estate investments in contaminated areas are associated, not only with the economic issue, but also with the promotion of environmental revitalization linked to social problems. The remediation and decontamination of previously impacted areas promotes the revitalization of neighborhoods as a whole, thus increasing the availability of properties with safe use. The real estate market is largely responsible for promoting the revitalization of these areas, given that the government continues to have serious obstacles in the inspection processes necessary to assign technical responsibility for revitalization and remediation.

However, although the contribution of investments in contaminated areas to improving the quality of life, health and human well-being is clear, it should be noted that the economic benefits of these investments can end up in the hands of a few. It has been reported that most of the population cannot fully access the economic benefits of revitalization. Such conditions point to the need for new guidelines for real estate production to collaborate with society as a whole.

It is in this scenario that the contribution of the 2030 Agenda becomes important, establishing objectives, indicators and targets. The Agenda can clarify what results are needed for investors to direct their work towards urban sustainability. Through the Agenda, it is possible to identify how the GAC benefits generated by real estate production can be allocated to achieve concrete goals in the life of the population.

Despite not having, at first, a direct relationship with the sector, SDG 4 involves sustainable actions of wide reach by companies, such as distribution of books and improvements in schools. The GAC's contribution to SDG 11 is also noted, by helping to build inclusive, safe, resilient and sustainable cities and human settlements. Although not cited by experts, the research showed the relationship between the revitalization of contaminated areas and SDG 3 (health and well-being) and SDG 6 (drinking water and sanitation), in addition to the other SDGs already identified. This is because promoting the health and well-being of the population refers to the environment in which this population is inserted and the quality of the soil available for different purposes. Therefore, the health and well-being of the population is directly related to the remediation and revitalization of these areas. Complementarily, this revitalization also affects the quality of the available water, since one of the concerns of the public sector with these areas is the contamination of water and the water table.

One can also mention SDGs 12 and 13. Objective 12 deals with responsible consumption and production. Soil contamination is mainly caused by the dumping of waste without proper treatment. In a rhythm of production and excessive consumption, this is precisely one of the most direct consequences, since more products are generated at a speed that makes it difficult to properly manage warehouses. In this sense, SDG 12 seeks a reduction of waste and toxic emissions that can be promoted, among other means, by the GAC.

Goal 13 provides for actions against global climate change. By disrupting the balance of the environment, climate change can worsen the levels of environmental contamination, just as contamination affects the balances of nature and, therefore, climate indexes. The purpose of SDG 13 is to promote urgent actions to combat climate change and its impacts, including measures to mitigate and adapt to the effects of pollution.

In this way, the 2030 Agenda demonstrates the objectives that the GAC, linked to the real estate activity, can meet in order to bring benefits to the quality of life, health and well-

being of the population in general. Some of them, due to the results obtained by the analysis of sentiments, present mostly negative results, that is, through words that expressed lack of knowledge, are already recognized in the perception of experts. The GAC can also contribute to the quality of soil and water, help reduce responsible consumption and production, and also join the fight against climate change.

5. CONCLUSIONS

In the perception of the experts interviewed, several GAC benefits were identified aimed at urban sustainability and a lack of knowledge regarding the contributions of management to the SDGs and the goals of the 2030 Agenda. Despite this assessment, it was possible to identify six SDGs in which the revitalization and remediation of areas contaminated areas play a central role: SDG 4, 11, 3, 12 and 13.

Real estate development in contaminated areas is characterized as an extremely important instrument for promoting the revitalization and reuse of properties, with emphasis on urbanization situations found in the Metropolitan Region of São Paulo - RMSP. This is because investments in these areas promote a double contribution. On one hand, it offers investors tax incentives, cheaper land compared to non-contaminated land. On the other hand, the social and environmental benefit is wide and lasting, promoting the possibility of decontaminated areas for the next generations.

The possibility of profit linked to concern for the environment summarizes the objectives of sustainable development necessary for the coming years of facing urban problems. This knowledge is essential for partnerships and local application, in neighborhoods and municipalities, when facing global problems concerning urbanization. Hence the importance of narrowing the SDG targets with real estate production considering the GAC.

This study allows the analysis, in the experts' perception, of the investments of the real estate market in contaminated areas, being punctuated benefits, risks, challenges, obstacles and contributions for the urban sustainability. However, it also shows that correlations with the SDGs are still poorly identified by experts. With this, the results suggest that the political and academic debate have a greater engagement of the GAC with specific objectives designed for the goals of the 2030 Agenda.

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