ISSN: 2446-6549
| Seção: Artigo |
http://dx.doi.org/10.18764/2446-6549.e202205

INTERESPAÇO
Revista de Geografia e Interdisciplinaridade

SYSTEMATIC MAPPING OF QUALITY OF LIFE INDICATORS: an analysis of dimensions for the Brazilian Amazon

MAPEAMENTO SISTEMÁTICO DE INDICADORES DE QUALIDADE DE VIDA: uma análise de dimensões para a Amazônia brasileira

MAPEO SISTEMÁTICO DE INDICADORES DE CALIDAD DE VIDA: un análisis de dimensiones para la Amazonía brasileña

---

Anabela da Silva Miranda
Graduated in Biological Sciences, Federal University of Pará – ICB/UFPA, Belém, Pará, Brazil.
silvamiranda14@hotmail.com / http://orcid.org/0000-0002-5491-7258

Ana Paula Vilhena Farias
Master's student at the Postgraduate Program in Anthropic Studies in the Amazon, Federal University of Pará – PPGEAA/UFPA, Castanhal, Pará, Brazil.
paulansfatima@gmail.com / http://orcid.org/0000-0003-1822-2376

Fernando Augusto Ribeiro Costa
Master's student in Sustainable Development Planning at the Center for Higher Amazon Studies, Federal University of Pará – NAEA/UFPA, Belém, Pará, Brazil.
fernando.costa@naea.ufpa.br / http://orcid.org/0000-0002-0226-7505

Jailson Soares de Souza Filho
Environmental Engineer from the University of the State of Pará – UEPA. Master's student of the Postgraduate Program in Anthropic Studies in the Amazon at the Federal University of the State of Pará – UFPA, Castanhal, Pará, Brazil.
engsoaresfilho@gmail.com / http://orcid.org/0000-0002-3278-4722

Luis Carlos Vale Caxiado
Graduating from the Institute of Exact and Natural Sciences, Federal University of Pará – ICEN/UFPA, Belém, Pará, Brazil.
darkmercy82@gmail.com / http://orcid.org/0000-0003-0180-939X

Saulo William da Silva Costa
Master in Anthropic Studies in the Amazon, Federal University of Pará – UFPA, Belém, Pará, Brazil.
saulo.si.costa@gmail.com / http://orcid.org/0000-0002-6073-8432

Vitor Lima da Costa Neto
Graduating from the Faculty of Computing, Federal University of Pará – Facomp/UFPA, Castanhal, Pará, Brazil.
vitor.neto@castanhal.ufpa.br / http://orcid.org/0000-0002-1407-5041

Cesar Guerreiro Diniz
Doctor in Geology and Geochemistry, Federal University of Pará – UFPA. Work for Solved LTDA, Belém, Pará, Brazil.
cesargdiniz@gmail.com / http://orcid.org/0000-0001-7718-0992

Yomara Pinheiro Pires
Doctor in Electrical Engineering. Teacher at the Postgraduate Program in Anthropic Studies in the Amazon, Federal University of Pará – PPGEAA/UFPA, Castanhal, Pará, Brazil.
yomara.ufpa@gmail.com / http://orcid.org/0000-0001-7724-6082

Marcos César da Rocha Seruffo
Doctor in Electrical Engineering with emphasis on Applied Computing. Teacher at the Postgraduate Program in Anthropic Studies in the Amazon, Federal University of Pará – PPGEAA/UFPA, Castanhal, Pará, Brazil.
seruffo@ufpa.br / http://orcid.org/0000-0002-8106-0560

Recebido: 01/04/2022; Aceito: 27/05/2022; Publicado: 28/10/2022.

ABSTRACT

The Amazon has been jointly glimpsed as a space where a wide range of differences emerge, both within and outside the region. Establishing ways to measure these diversities through the prism of the quality of life and well-being of their populations is an urgent initiative to be satisfied. Thus, this article presents the application of the PICOC methodology for mapping the indicators from the actions that represent the quality of life and welfare of the population of the Brazilian Amazon. A systematic mapping was carried out in five scientific databases in order to map works published in the period from 2017 to 2021. As results, 31 indices related to quality of life and well-being were found arranged in the dimensions of environment, health, education, governance, social programs, and income. The dimensions of environment, health, education, governance, and social programs and income are the main recurrences. The findings allowed as contributions: (i) quantify and qualify the works, listing their sources, year of publication, area of application and repository of origin; (ii) identify the most recurrent dimensions of the indicators found; (iii) relate the indexes to the quantities of dimensions that compose them.

Keywords: Quality of life; Well-being; Systematic Mapping; Amazon; Indices; Indicators.

RESUMO

A Amazônia é vislumbrada conjuntamente como um espaço onde emergem as mais diversas diferenças, tanto dentro como fora da região. Estabelecer formas de medir essas diversidades pelo prisma da qualidade de vida e bem-estar de suas populações é uma iniciativa urgente a ser satisfeita. Assim, este artigo apresenta a aplicação da metodologia PICOC para mapeamento dos indicadores das ações que representam a qualidade de vida e bem-estar da população da Amazônia brasileira. Foi realizado um mapeamento sistemático em cinco bases científicas para mapear os trabalhos publicados no período de 2017 a 2021. Como resultados, foram encontrados 31 índices relacionados à qualidade de vida e bem-estar dispostos nas dimensões de meio ambiente, saúde, educação, governança, programas sociais e renda. As dimensões de meio ambiente, saúde, educação, governança e programas sociais e renda são as principais recorrências. Os achados permitiram como contribuições: (i) quantificar e qualificar os trabalhos, listando suas fontes, ano de publicação, área de aplicação e repositório de origem; (ii) identificar as dimensões mais recorrentes dos indicadores encontrados; (iii) relacionar os índices às quantidades de dimensões que os compõem.

Palavras-chave: Qualidade de vida; Bem-estar; Mapeamento Sistemático; Amazonas; Índices; Indicadores.

RESUMEN

La Amazonía se ha vislumbrado en conjunto como un espacio donde emerge una amplia gama de diferencias, tanto dentro como fuera de la región. Establecer formas de medir estas diversidades a través del prisma de la calidad de vida y el bienestar de sus poblaciones es una iniciativa urgente a ser satisfecha. Así, este artículo presenta la aplicación de la metodología PICOC para el mapeo de los indicadores de las acciones que representan la calidad de vida y el bienestar de la población de la Amazonía brasileña. Se realizó un mapeo sistemático en cinco bases de datos científicas con el fin de mapear trabajos publicados en el período de 2017 a 2021. Como resultados se encontraron 31

índices relacionados con calidad de vida y bienestar ordenados en las dimensiones medio ambiente, salud, educación, gobernanza, programas sociales e ingresos. Las dimensiones de medio ambiente, salud, educación, gobernabilidad y programas sociales e ingresos son las principales recurrencias. Los hallazgos permitidos como aportes: (i) cuantificar y calificar los trabajos, relacionando sus fuentes, año de publicación, área de aplicación y repositorio de origen; (ii) identificar las dimensiones más recurrentes de los indicadores encontrados; (iii) relacionar los índices con las cantidades de dimensiones que los componen.

Palabras clave: Calidad de vida; Bienestar; Mapeo Sistemático; Amazonas; Índices; Indicadores.

INTRODUCTION

From the reports of the first travelers who explored the Amazon to the most recent speeches disseminated about it, the constructed mentality almost always seeks to highlight the grandeur of its biodiversity, the extremes of its landscape, which goes from the river to the highway, from the forest to the cities, and the mosaic formed from the differences present in this corner that extends over more than half of the Brazilian territory. Such differences are converted into inequalities when the low indexes attested by various socio-environmental, economic and educational indicators are analyzed, whether the HDI (Human Development Index)[1], o Social Progress Index[2] (IPS, in Portuguese) or the Social Vulnerability Index[3] (IVS, in Portuguese), in addition to the deforestation rate PRODES (Project for Monitoring Deforestation in the Legal Amazon by Satellite, of the National Institute for Space Research/INPE)[4]. As an example, the Amazon has an IPS (57.31) lower than the national average (67.73). The region presents results below the average of Brazil for all dimensions and almost all components of the IPS, according to the IPS Amazonia report (2014).

Most human indicators are based on numbers and statistics, such as the HDI, whose dimensions considered are education, longevity, and income; even the national environmental indicators, from the Brazilian Ministry of Environment (2014), take into account quantitative data. Environmental indicators are selected statistics that represent or summarize some aspects of the state of the environment, natural resources, and related human activities. This discrepancy between the actual practice of communities and national indicators – these by their nature abstract and universal – have led to misunderstandings of what quality of life is, either on the national or local side (Brasil, 2014).

[1] https://www.br.undp.org/content/brazil/pt/home/idh0.html
[2] http://www.ipsamazonia.org.br
[3] http://ivs.ipea.gov.br/index.php/pt
[4] http://www.obt.inpe.br/OBT/assuntos/programas/amazonia/prodes

The search for indicators – and their indexes – produced from quali-quantitative aspects, which portray the reality of the region, makes it possible to generate an increase in the efficiency of investment strategies in various sectors reported as Priority Technology Areas by the Ministry of Science, Technology and Innovations (MCTI) of Brazil. This technological impact tends to direct strategies to combat risk factors related to the economy, well-being, illness, consumption, among others, and may generate expert systems that help public managers in decisions for social actions.

In view of the exposed problem, this article presents the use of the PICOC methodology for mapping in the literature the indicators from the actions that take into account the quality of life and welfare of the population of the Brazilian Amazon, based on indexes such as welfare, health, environment and opportunities, supported by the practices and values of the Amazonian people and communities.

The article is structured in the following way: section two presents the theoretical basis and the discussion about what quality of life would be in a region as heterogeneous as the Amazon and the lack of indicators that reflect its diversities. Section 3 discusses the methodology and the material that served as a basis for the research, as well as the exclusion criteria and the steps taken to prepare the article. Section 4 presents the results and discusses what they reveal in relation to the quality of life in the Amazon.

THEORETICAL REFERENTIAL

Quality of Life and Human Well-Being Indicators

Prior to the social constitution of humanity, there was a concern with the maintenance of life in the midst of daily practices to meet needs such as food and reproduction. In addition to prolonging life, there was, and still is, the desire that the course of this period may be constituted of instruments and environments that provide good conditions for development and social and individual satisfaction (Siche et al., 2007).

When addressing the issue of quality of life, it is not uncommon to find it used as a synonym for well-being, which, in turn, is presented as being directly proportional to the level of development of the place being researched (Alaimo et al., 2021). Following this developmentalist line, however, relevant social issues such as culture, food, work-life balance, and interaction with the environment are not exposed. Such conditions have been the object of study and analysis of societies (Lacerda & Acosta, 2017; Aria et al., 2020).

In this sense, governmental organizations have sought to quantify the scope of what would be consolidated as quality of human life. Such quantification, almost always permeated by subjective-qualitative elements, is materialized in indexes and indicators. These two terms are commonly used in literature as synonyms; however, in the present article, the same idea of Siche et al. (2007) is considered: the indicator is defined as an isolated analysis parameter that, together with other indicators, reflects the condition of a system. The index, however, represents a value that entails the interpretation of the reality of a simple or complex system that may be composed of indicator variables.

For example, when approaching quality of life, it is essential to highlight the multiple faces that it encompasses, from universal issues to social configurations such as health and economy. Each observed aspect receives the denomination of indicator and this can be analyzed, according to their areas of knowledge, based on appropriate references and procedures, generating and composing varied definitions and conceptions.

Permeating both indexes and indicators, the dimensions are considered. These correspond to the macro contexts in which the indexes are inserted and that can be translated as collective human realities such as, for example: environment, health, education, access to land, and accessibility. In this way, we would have a design in which the indexes are divided into macro dimensions and are composed of indicators; the indicators can be divided into micro dimensions and are composed of quantitative information collected in a given researched reality.

Understanding the quality of life goes through numerous fields of human knowledge, biological, social, political, economic, medical, among others, in a constant interrelationship, translated into the interdisciplinary nature of research. It is a research area in the process of affirmation of borders and concepts; therefore, definitions about the term are common, but not always in agreement (Almeida et al., 2012).

Debates around development questions and pretensions have been becoming increasingly present in Brazilian society, especially with regard to the Brazilian Amazon region. More than the general statistical data, often erroneous, presented through superficial or generalist observations can comprehend, the dimensions of this ecosystem and the Amazonian peoples have their lives directly linked to the forest and should be the first to be heard with regard to this ecosystem.

The indicators analyzed are usually explicitly identified where their incidence is observed, but it makes it impractical to ponder which is the most important one for assessing quality of life. From a policy point of view, for example, as well as from an etiological point of view, it is important to understand the relationship of these with

education, because the policies that can be implemented would be different from the policies needed if income were considered the most influential factor (Salgado et al., 2020, p. 10).

Therefore, trying to equate different indicators resulting in indexes as diverse as the Amazon itself, definitely does not consist of a trivial task. Added to this is the fact that around the globe there are many ways implemented to arrive at a quality of life and well-being index; however, they may present weaknesses or invalidity when applied to the Amazon. In this sense, it is of utmost importance to map contemporary indicators and trace their dimensions in order to verify how studies have been applied to determine similar scenarios (in the sense of being heterogeneous within the same region) to that of the Brazilian Amazon.

Quality of Life in the Amazon Context

The transformations that world society has gone through, since the advent of modern sciences, have led to the emergence of new standards of living and behavior in almost all countries then existing. In this sense, habits and behaviors in all areas started to be dictated and carried out under the optic of improving living and health conditions at the same time that they sought to create, or improve, the mechanisms through which general welfare would be achieved.

It is in this sense that governments of the most diverse countries and ideological shades sought, throughout the 20th century, to establish ways to verify this welfare among their population and, secondly, to have data to be compared between countries. Thus, one could visualize which sphere needed to be improved, which achieved good results, and which country could be used as a standard to be followed regarding the quality of life of its population (Kaminitz, 2020).

Given the context described, one cannot leave aside the fact that quality of life is a term with a polysemic meaning and that, however obvious it may be, is crossed by dimensions that need to be understood. In this way, the social and economic conquests together with the advance of what is called democracy, especially in Western countries after 1945, brought to mankind the opportunity to search for satisfaction in the personal and family, love/sentimental, social, environmental, labor, and even in the existential question itself (Minayo et al., 2000).

Minayo et al. (2000), despite indicating the polysemy of the term, note that it can be understood in what they call "reference forums": i) the first forum is the historical; ii)

cultural; and iii) the forum mediated by social stratifications or classes. The first concerns the understanding of changes in behaviors and patterns that may be accepted as satisfactory in a given historical moment in a given society and that in another may be abandoned or even repelled precisely for the sake of a relatively better quality of life.

The second forum refers to the data under which some groups and societies may judge quality of life factors, while in another cultural context such factors are irrelevant or even rejected. In this aspect, there are values that may even be shared by different societies, but not at the same level of hierarchy as in others, revealing an almost impossibility of homogenizing the indicators considered for the elaboration of an index.

The third forum, still following Minayo et al (2000), concerns the perceptions of the representatives of the social classes present in each geographical reality. The authors point out that the idea of quality of life may be evaluated according to the scope of the conditions present in the wealthier social strata.

Lucerda and Acosta (2017), for example, present and apply indicators focused on Traditional Peoples of the Amazon in which they portray collective control, cultural and food practices, tranquility in the environment, self-care, and reproduction in a riverside community of São José, Benjamin Constant, border between Brazil, Colombia, and Peru. According to the same authors, there are several correlations that emerge from these indicators, such as conflicts over the preservation of the forest, access to public policies and guarantee of rights, contact with natural resources, and diversity of creeds, among others.

Considering that the Amazon has peculiar characteristics in terms of biophysical, socioeconomic, and cultural aspects, according to its ecosystems, it is necessary to search for indicators that can effectively reflect the quality of life of resident communities, with the capacity to measure well-being in the Brazilian Amazon. However, understanding these relationships is not a trivial task, since the studies are generalist and there are specific concepts for each region. Therefore, the search for an indicator capable of measuring complex facets is based on the systematic mapping of these classic indicators that are in use.

MATERIALS AND METHODS

According to Kitchenham (2007), a Systematic Mapping (SM) helps to obtain a broad view of a research area and to find evidence on a given topic. MS is an organized, unbiased and replicable technique that allows the identification of the main elements of a

subject in the state of the art, aiming at qualifying and quantifying the papers, unlike the systematic review, which has a focus on the latter. Thus, SM was the most effective methodology for the present study, since it aimed at the discovery, qualification, and quantification of the works found. To facilitate the tabulation of the references found, we used *Parsifal*[5], which is a tool that assists in planning, conducting and conducting the SM.

Research Question and Eligibility Criteria

Developing the research question in conjunction with the SM enables the best available information to be obtained efficiently and accurately. The PICOC[6] strategy is used to assist in what the research question should actually specify. The PICOC strategy can be used to construct research questions of various natures. Several papers use PICOC in their research (Bosu & Bosu, 2021; Bruzza et al., 2017; Jones et al., 2021; Quezada et al., 2021; Shaikh et al., 2015), so adaptation is based on the context of this research.

Since the research in question used the SM and was based on the PICOC strategy, the research question was elaborated corresponding to the following keywords: P = index, indicator; I = quality of life, well-being; C = not applicable; O = representation, tabulation, mapping; and C = Amazon; thus, composing the research question: "Are there indices or indicators for representing the quality of life in the Brazilian Amazon?".

From the selected key words, terms were established with their respective developments, aiming to increase the range of works found on the subject. The synonyms used for the search are described below (Table 1).

Table 1 – Search words and corresponding terms

Keywords	**Synonyms**
Amazônia	Amazon, Brazilian's north, North of Brazil, Region
Bem estar	Wellbeing, Well being, Well-being
Indicador	Indicator
Índice	Index
Mapeamento	Mapping
Qualidade de vida	Quality of life
Representação	Represent
Tabulação	Tabulation

Source: Authors (2021).

[5] https://parsif.al/

[6] Acronym for P: population/patients; I: intervention; C: comparison/control; O: outcome; C: context.

From this formulation a search string was established with the respective categories of keywords joined by the Boolean operator "AND" and, within these, the synonyms were joined by the Boolean operator "OR". The following search string variations were performed: ("Indicador" OR "Indicator" OR "Índice" OR "Index") AND ("Bem-estar" OR "Wellbeing" OR "Well being" OR "Well-being" OR "Qualidade de vida" OR "Quality of life") AND ("Amazônia" OR "Amazon" OR "Brazilian's north" OR "North of Brazil" OR "Region") AND ("Mapeamento" OR "Mapping" OR "Representação" OR "Represent" OR "Tabulação" OR "Tabulation").

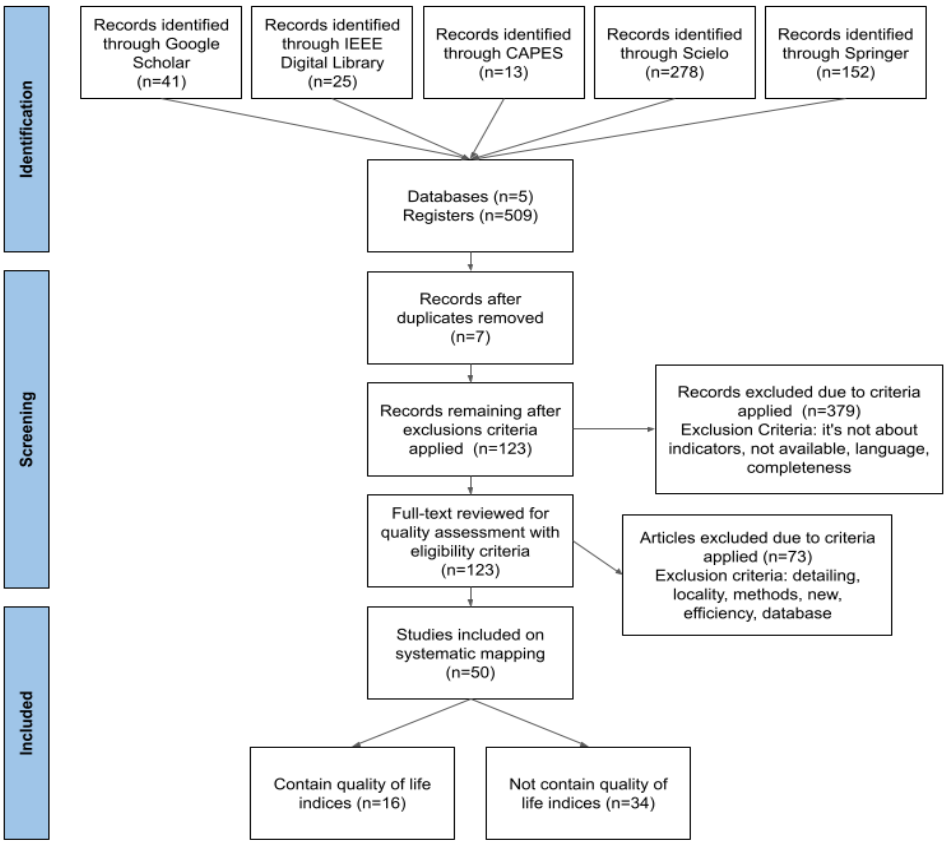
The repositories chosen for the search were: Google Scholar[7], IEEE Digital Library[8], Periódico Capes[9], SciELO Citation Index[10] and Springer Link[11], filtering the search to papers produced within five years. Fig. 1 shows graphically the distribution of articles per searched base. From the collection of articles, we applied as Inclusion Criteria (IC) the presence of index or indicator related to quality of life and as Exclusion Criteria (EC): 1) the fact that the publication is duplicated; 2) the publication does not address the theme of indicators, indexes or quality of life; 3) the publication is not available in full text; 4) the publication is not in Portuguese, Spanish or English and 5) the publication has incomplete information.

Study Selection

First it was selected, from the search string, the literatures in the five databases used in this research, totaling 509 scientific articles, in which the IC and EC were applied, removing, initially, 7 duplicate articles. Thus, 502 papers were the titles and abstracts, in order to apply the remaining criteria (articles that were not about indicators, were not available, were not written in the selected languages or were not complete), subtracting 379 articles and resulting in 123 relevant papers, as shown step by step in Fig. 1.

[7] https://scholar.google.com.br/
[8] http://ieeexplore.ieee.org
[9] http://www-periodicos-capes-gov-br.ezl.periodicos.capes.gov.br/index.php
[10] https://www.webofknowledge.com/
[11] http://link.springer.com

Fig. 1 – PRISMA flow diagram demonstrating screening method for articles[12]



Source: Authors (2021).

The next step consisted of a qualitative analysis of the remaining articles (123), according to 7 pre-established questions: 1) Is the calculation of the indicator or index detailed? 2) Is it for a specific region (other than the Legal Amazon)? 3) Is it for the Brazilian Amazon? 4) Is the methodology clear? 5) Is a new indicator or index proposed? 6) Does it show the effectiveness or efficiency of the indicator or index? and 7) Does it indicate the origin of the database for the index or indicator? Thus, the articles received corresponding scores in relation to each question, and those that reached a cut-off score of 4.29 or higher were accepted, as shown in Fig. 1. As a result, 73 papers were excluded and 50 were selected. From the resulting 50 papers, those that contained quality of life indexes were separated, resulting in 16, according to Table 2.

Among the articles selected for the studies, the following activities were carried out, listed as a contribution of this research: (i) quantification and qualification of the papers, listing their sources, year of publication, area of application and repository of origin; (ii) identification of the most recurrent dimensions of the indicators found; (iii) relationship of the indexes to the quantities of dimensions that compose them.

[12] Adapted from Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D. et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews.

Additionally, the IPS Amazon and HDI indexes were included in the survey, coming from external sources, as they are applied in Brazil to measure the quality of human life, the first being focused on the legal Amazon region and the second for the country, as well as for specific regions.

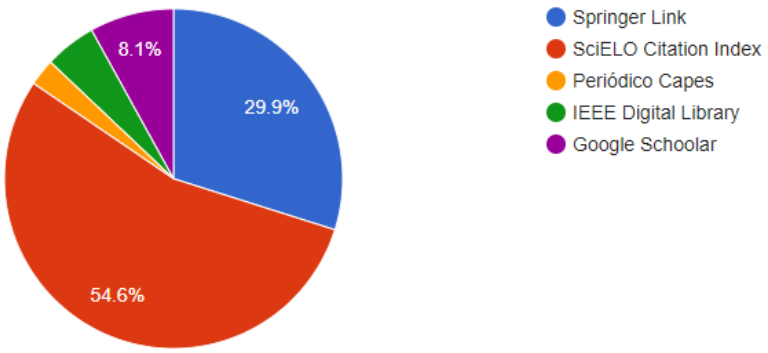
RESULTS AND DISCUSSION

Considering the first step performed with the search string, the numbers of selected articles per database are as follows: 78 of 278 from SciELO; 22 of 152 from Springer Link; 16 of 41 from Google Scholar; 7 of 13 from CAPES journals; and of 25 from the IEEE Digital Library, none were selected. The graph representing these numbers can be seen in Fig. 2.

Table 2 – Indices and articles source of the indices used to evaluate the quality of life in the last five years

Authors	Articles	Indices
Agostinis-Sobrinho et al (2020)	Estado de Saúde Cardiovascular Ideal e Qualidade de Vida relacionada à saúde em adolescentes: o estudo de Atividade Física – LABMED	Optimal Cardiovascular Health Index (OCHI)
		Health-Related Quality of Life (HRQoL)
Antunes et al (2018)	Oral health outcomes: the association of clinical and socio-dental indicators to evaluate dental caries in preschool children	Early Childhood Oral Health Impact Scale (ECOHIS)
Bhatti et al (2017)	Spatial interrelationships of quality of life with land use/land cover, demography and urbanization	Quality of Life and landcover (QoL and Landcover)
Cáceres Seguel & Ahumada Villarroel (2020)	Acceso a equipamiento urbano calidad de vida. Quilpué y Villa Alemana, Chile	Access to urban equipment and quality of life (AUEQL)
Ferraz et al (2020)	Linking Human Development and the Financial Responsibility of Regions: Combined Index Proposals Using Methods from Data Envelopment Analysis	Capability Index Adjusted by Social Efficiency (CIASE)
		Deprivation and Financial Responsibility based Prioritization Index (DFRP)
Greyling & Tregenna (2017)	Construction and Analysis of a Composite Quality of Life Index for a Region of South Africa	Composite Index of Quality of Life (CIQoL)
Guimarães et al (2016)	Desflorestamento e incidência de malária na região da Amazônia Legal entre 1996 e 2012	Annual Parasitic Index (API
Maridal (2017)	A Worldwide Measure of Societal Quality of Life	Worldwide Measure of Society Quality of Life (SWQoLM)
Neri et al (2018)	Factors associated with perceived quality of life in older adults: ELSI-Brazil	Perceived Quality of Life Scale (PQoL)
Ortiz Benavides & Núñez Velázquez (2019)	Contributions for the construction of a global measure of poverty: The case of Colombia 2011-2017	Global Poverty Indicator (Global PI)
Patrick et al (2019)	Human Wellbeing and the Health of the Environment: Local Indicators that Balance the Scales	Organization for Economic Cooperation and Development – Better Life Initiative
		Sustainable Society Index (SSI)
		Quality of Life Indicators (EM – QoLI)
		Wellbeing Index (WI)
		Environmentally Responsible Happy Nations Index (ERHNI)
		Environmental Efficiency of Wellbeing (EEoW)
		Happy Planet Index (HPI)
		Genuine Progress Indicator (GPI)
		Environmental Sustainability Index (ESI)
		Quality of Life (QoL)
		Sustainability Assessment by Fuzzi Evaluation (SAFE)
Ramos et al (2020)	Índice de áreas verdes como estratégia ao desenvolvimento urbano sustentável das Regiões Norte, Noroeste e Meia Ponte de Goiânia-GO, Brasil	Green Areas Index (GAI)
Rocha et al (2019)	Indicador de salubridade ambiental para Campina Grande, PB: adaptações, desenvolvimentos e aplicações.	Environmental Health Indicator (EHI)
Sánchez et al (2018)	A Space–Time Study for Mapping Quality of Life in Andalusia During the Crisis	Quality of Life in Andalusia (QoL in Andalusia)
Sousa et al (2018)	Validade de constructo da escala Condições do Ambiente e Características de Aprendizagem na Universidade (CACAU)	Health and Quality of Life Indicators for Academics (HQoLI for Academics)
Sruthi Krishnan (2021)	Impact of land use and land cover change on the environmental quality of a region: A case of Ernakulam district in Kerala, India	Environmental Quality Index (EQI)

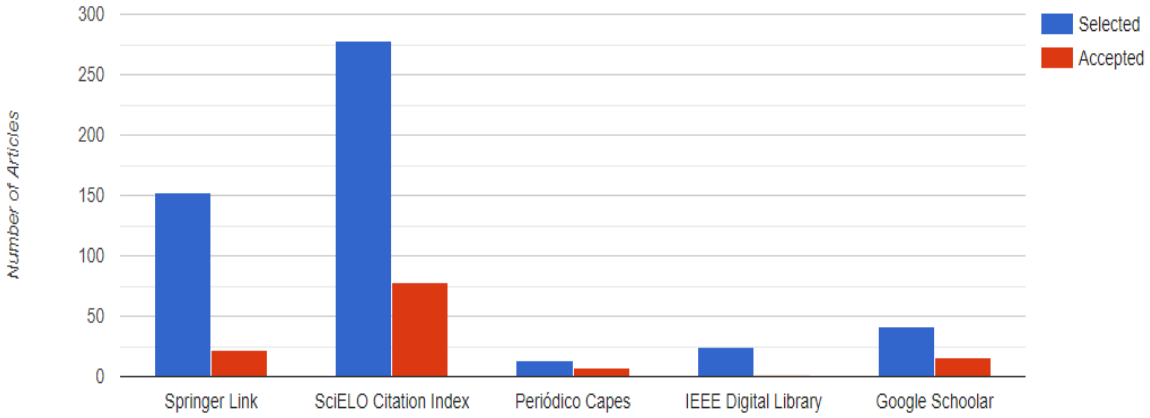
Fig. 2 – Distribution of papers per database: IEEE (4.9%) and Periódicos Capes (2.6%)



Source: Authors (2021).

Regarding the distribution of articles accepted or rejected in the review process, in relation to the databases they came from, there is a description in Fig. 3. It can be seen that the SciELO database had the largest number of accepted articles, due to the fact that it had more articles collected on the research theme. The IEEE database did not have any accepted articles.

Fig. 3 – Relationship between articles found and articles selected by database



Source: Authors (2021).

With respect to the years of publications used in this research, we have the following division: 105 are from the year 2016; 182 from 2017; 161 from 2018; 175 from 2019; 203 from 2020; and 28 from 2021. Such data can be graphically visualized in Fig. 3 and reflects the stability of research of this nature throughout the year, however, the year 2021 corresponds only to the first 3 months.

One point to be highlighted from the papers is that of the remaining 50 articles, 34 were conducted in the Americas, 22 included Brazil, and 18 applied only in the Brazilian scenario, followed by 6 in Colombia, 5 in Chile, 2 in Argentina, 2 in the United States, and 1 in countries such as Peru, Costa Rica, Mexico, and Ecuador. However, it is important to

note that the fact that most of the selected papers come from the Americas, or even from Brazilian regions, may be related to the qualitative criteria applied, since articles that fit these categories received higher scores.

Among the 50 articles, 16 presented quality of life indexes. We highlight the following work "Human Wellbeing and the Health of the Environment: Local Indicators that Balance the Scales" was the work that provided the most indexes, with a total of 12, followed by the articles "Linking Human Development and the Financial Responsibility of Regions: Combined Index Proposals Using Methods from Data Envelopment Analysis" and "Estado de Saúde Cardiovascular Ideal e Qualidade de Vida relacionada à saúde em adolescentes: o estudo de Atividade Física – LABMED", generating 2 indexes each.

In this sense, we found 30 indexes[13] used in the last five years to measure the quality of human life in the world. These indexes are related to 14 dimensions that group a specific number of indicators. Among them, Health stands out in its multiple aspects, having a notable prominence by comprising 49 indicators (Fig. 4). Buss (2020) states that providing health means, besides avoiding diseases and prolonging life, ensuring means and situations that expand the quality of life "lived", that is, expand the capacity for autonomy and the standard of well-being which, in turn, are socially defined values, importing values and choices. This was corroborated by recent studies carried out in China, which concluded that educational activities for children or leisure activities for adults, related to health, are more efficient in improving individual subjective well-being, confirming the importance of this dimension for quality of life human (Xie et al., 2021; Wang et al., 2021)

In second place among the dimensions with the highest incidence is Environment, with 47 indicators. In this sense are the positive associations between the determinants built and natural environment and the way they influence mobility, behaviors and habits, impacting positively on the general indicators of mortality and morbidity from chronic diseases; therefore, on the health of the population (Salgado et al., 2020) (Fig. 4). In contrast, "Access to technology", "Food security", and "Gender and race inequality" appear covering the smallest amounts of indicators, being, respectively, 3, 5, and **6** (Fig. 4).

The consequences of patriarchal culture in women's lives are expressed in less power, less participation, and fewer rights; racial prejudice is characterized by the belief that there are individuals with superior characteristics, based simply on appearance or empathy. All of this has been constituted throughout the historical and social construction of the concept of separation or superiority that exists until today. As these social demands are generally invisibilized, they are constantly included in large groups to be studied and,

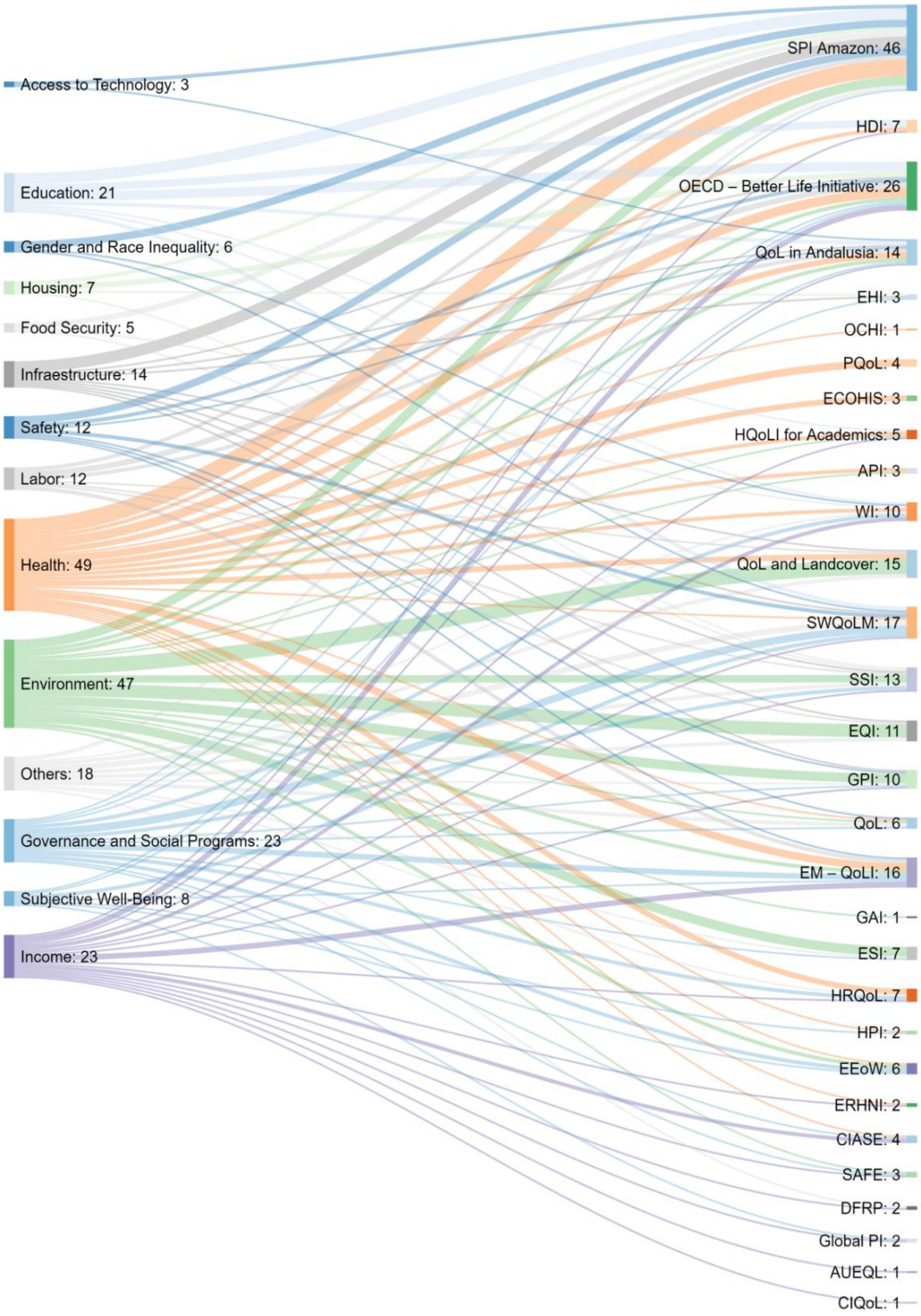
[13] https://github.com/PPGEAA/indicadores_qualidade_de_vida/blob/main/30indices_selected.pdf

consequently, do not appear in research that is not directly focused on the theme of gender and racial diversity.

Moreover, the IPS Amazon index was the only one focused on the Amazon region that addressed all the 14 dimensions listed, especially health, infrastructure, and education (Fig. 5). This same index also presented the largest number of indicators, 46 in total, which reiterates its prominence among the other indexes, thus demonstrating the complexity of information and relationships that permeate studies focused on the Amazon territory, as well as the lack of studies focused on the Brazilian Amazon.

Subsequently, we have the OECD – Beter Life Initiative, SWQoLM and EM – QoLI indexes that presented, respectively, 26, 17 and 16 indicators. These indicators predominantly address aspects related to Health, Education, and Social Programs; thus, these reinforce that when addressing quality of life, it is necessary to encompass both particular aspects and common structures of the society being analyzed.

Fig. 4 – Index-related dimensions and their respective numbers of indicators used to measure the quality of life in the last five years.



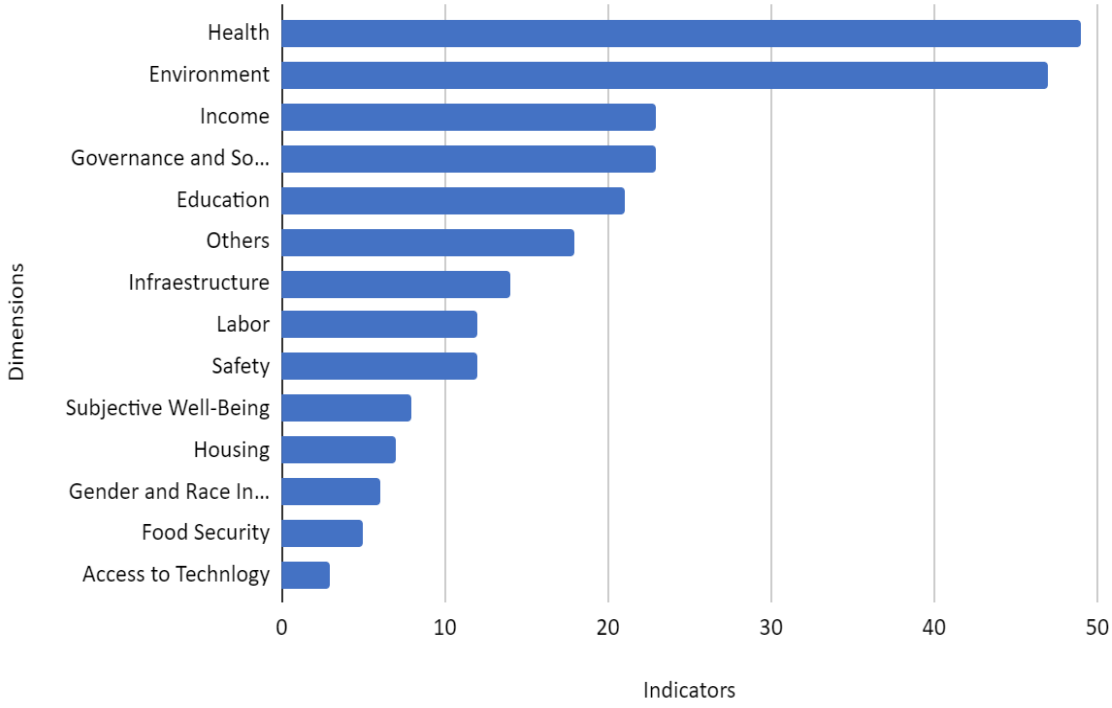
Source: Authors (2021).

In addition, the dimensions Health and Environment stood out for having the largest number of general indicators, being, respectively, 49 and 47 surveyed for the present study. Besides them, "Incomes" and "Governance and social programs" came next with 23

indicators each, and then "Education", covering 21 indicators, unlike what was observed for "Access to technology", which has only 3 indicators for the present study (Fig. 5).

Urban and rural spaces are inserted as different expressions materialized geographically and understood by their distinct economic, cultural, technical, and structural dynamics. Although they compose environments that are considered distinct, their interrelations are quite complex. Therefore, it is often difficult to separate or understand the specificity of each of these concepts. However, beyond this simple and introductory definition, it is interesting to realize that rural and urban are, above all, different types of daily practices. Thus, there can be rural practices in the space of cities or urban practices in the space of the countryside.

Fig. 5 – List of dimensions and number of indicators that have.



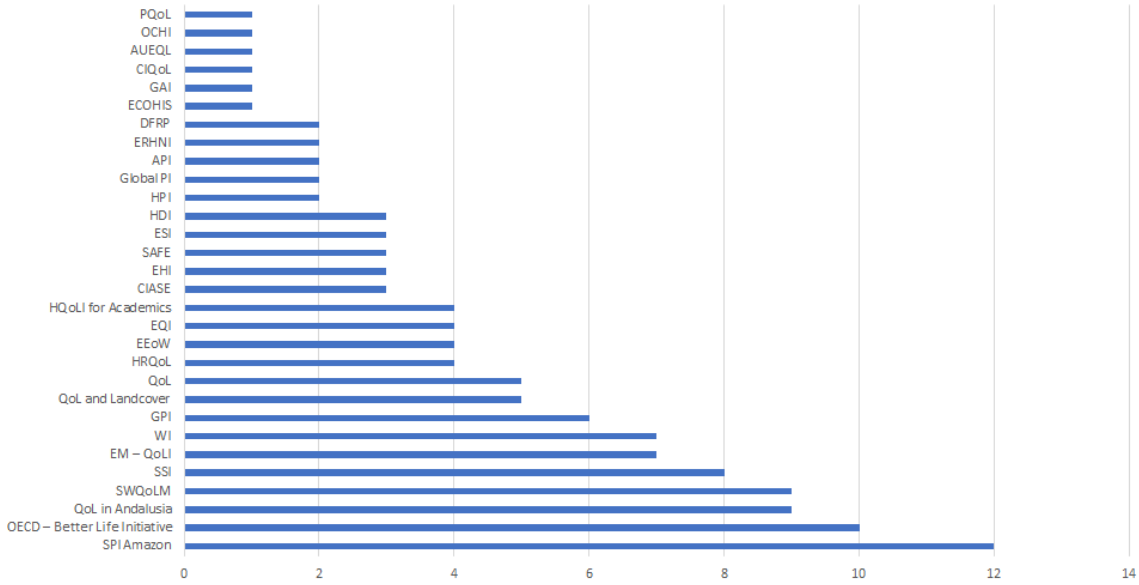
Source: Authors (2021).

Among the indices obtained, IPS Amazon and OECD - Better Life Initiative stand out for the wide range of dimensions that cover 12 and 10, respectively, out of a total of 14, having a multidimensional analysis of well-living over the years (Fig. 5).

OECD – Better Life Initiative refers to an index for 37 countries, but also has statistics by regions. There are 391 regions based on 11 aspects and 35 variables. In addressing quality of life, the OECD Better Life Initiative aims to promote "better policies for better lives". This, in turn, makes up a statistical report that is released every two years by means of wide-ranging documents whose well-being results show relativity over time, between population groups, and between countries (OECD, 2015 and 2016).

Besides them, "Quality of life in Andalusia" and "A Worldwide Measure of Society Quality of Life" appear in third position, linked to 9 dimensions of quality of life. In contrast, 6 indices appear linked to only 1 dimension, these being: The Perceived Quality of Life Scale (PQoL), Ideal Cardiovascular Health Index (OCHI), Access to urban equipment and quality of life (AUEQL), Composite Index of Quality of Life – (CIQoL), Green Areas Index (GAI) and Early Childhood Oral Health Impact Scale (ECOHIS), as can be seen in the figure (Fig. 6).

Fig. 6 – Relationship between indexes and the number of dimensions they contain.



Source: Authors (2021).

CONCLUSION

The Amazon is a plural region marked by diverse and peculiar characteristics in terms of socioeconomic and cultural concepts, lacking quality of life and well-being indices that effectively portray the reality experienced by the Amazonian peoples. Therefore, this work aimed to map the indexes and indicators used in the last five years to measure the quality of human life, through the PICOC strategy and the SM methodology, besides verifying the existence, or not, of such attributes in the Brazilian Amazon context.

The strategy developed in this proposal was effective for elaborating the key question, composed of the guiding words of the work, facilitating the application of the systematic mapping methodology, employed for its efficiency in discovering, quantifying and qualifying works, guaranteeing a broad view of a certain research topic. Thus, as a result, the SM resulted in 509 articles obtained from five scientific bases, leaving 123 papers that were analyzed qualitatively by the authors. Of these, 50 articles had a score above the

pre-selected cut-off value and met parameters that can be used to characterize the peculiarities of regions such as the Brazilian Amazon. Thus, 16 studies had quality of life indexes, enabling the identification of the indicators that compose them.

Among the contributions of this article, it was possible to (i) quantify and qualify the works, listing their sources, year of publication, area of application and repository of origin; (ii) identify the most recurrent dimensions of the indicators found; (iii) relate the indices to the quantities of dimensions that compose them. Thus, Health and Environment were the most recurrent dimensions, comprising 49 and 47 indicators, respectively, and only one index, IPS Amazon, was focused on the Amazon region, being also the one that presented the highest number of indicators (46), followed by OECD – Better Life Initiative (26).

A limitation of this work is the need for research in other means of dissemination, other than the databases used, since many indicators may be published in technical reports, books etc. As future works, it is expected to elaborate a new index that aims at approaching the quality of life for the Amazon region, as a way to expand the studies about this subject for the location, considering the case study presented here. In addition, a set of indicators from this SM may be used, with the intention of proposing a hybrid indicator that is more reliable to the peculiarities of the region.

DECLARATIONS

This study was funded by Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq through the edital 11/2020 MAI/DAI.

REFERENCES

AGOSTINIS-SOBRINHO, C., WERNECK, A. D. O., KIEVIŠIENĖ, J., MOREIRA, C., RAMÍREZ-VÉLEZ, R., ROSÁRIO, R., ... & SANTOS, R. Estado de saúde cardiovascular ideal e qualidade de vida relacionada à saúde em adolescentes: estudo labmed. **Revista Paulista de Pediatria**, 2020, p. 39.

ALAIMO, L. S., ARCAGNI, A., FATTORE, M., & MAGGINO, F. Synthesis of multi-indicator system over time: a poset-based approach. **Social Indicators Research**, 2021, 157(1), p. 77-99.

ALMEIDA, M. D., GUTIERREZ, G. L., & MARQUES, R. Qualidade de vida: definição, conceitos e interfaces com outras áreas de pesquisa. São Paulo: **Escola de artes, ciências e humanidades**–*EACH/USP*, 2012, p. 142.

ANTUNES, L. A. A., ORNELLAS, G., FRAGA, R. S., & ANTUNES, L. S. Oral health outcomes: the association of clinical and socio-dental indicators to evaluate dental caries in preschool children. **Ciencia & saude coletiva**, 2018, 23, p. 491-500.

ARIA, M., MISURACA, M., & SPANO, M. Mapping the evolution of social research and data science on 30 years of Social Indicators Research. **Social Indicators Research**, 2020, 149(3), p. 803-831.

BHATTI, S. S., TRIPATHI, N. K., NAGAI, M., & NITIVATTANANON, V. Spatial interrelationships of quality of life with land use/land cover, demography and urbanization. **Social indicators research**, 2017, 132(3), p. 1193-1216.

BOSU, W. K., & BOSU, D. K. Prevalence, awareness and control of hypertension in Ghana: A systematic review and meta-analLysis. **PloS one**, 2021, 16(3), e0248137.

BRUZZA, M., CABRERA, A., & TUPIA, M. Survey of the state of art based on PICOC about the use of artificial intelligence tools and expert systems to manage and generate tourist packages. **In 2017 International Conference on Infocom Technologies and Unmanned Systems** (Trends and Future Directions) *(ICTUS)*, 2017, December, (pp. 290-296). IEEE.

BUSS, P. M., ALCÁZAR, S., & GALVÃO, L. A. Pandemia pela Covid-19 e multilateralismo: reflexões a meio do caminho. **Estudos Avançados**, 2020, 34, p. 45-64.

CÁCERES SEGUEL, C., & AHUMADA VILLARROEL, G. Acceso a equipamiento urbano y calidad de vida. Quilpué y Villa Alemana, Chile []. **Bitácora Urbano Territorial**, 2020, 30(3), p. 263-275.

FERRAZ, D., MARIANO, E. B., REBELATTO, D., & HARTMANN, D. Linking human development and the financial responsibility of regions: Combined index proposals using methods from data envelopment analysis. **Social Indicators Research**, 2020, 150(2), p. 439-478.

GREYLING, T., & TREGENNA, F. Construction and analysis of a composite quality of life index for a region of South Africa. **Social Indicators Research**, 2017, 131(3), p. 887-930.

GUIMARÃES, R. M., VALENTE, B. C., FARIA, P. A., STEPHANELLI, L. L., CHAIBLICH, J. V., & ARJONA, F. B. S. Desflorestamento e incidência de malária na região da Amazônia Legal entre 1996 e 2012. **Cadernos Saúde Coletiva**, 2016, 24(1), p. 3-8.1

JONES, S. K., SÁNCHEZ, A. C., JUVENTIA, S. D., & ESTRADA-CARMONA, N. A global database of diversified farming effects on biodiversity and yield. **Scientific Data**, 2021, 8(1), p. 1-6.

KAMINITZ, S. C. Looking good or feeling well? Understanding the combinations of well-being indicators using insights from the philosophy of well-being. **Social Indicators Research**, 2020, p. 1-16.

KITCHENHAM, B., & CHARTERS, S. Guidelines for performing systematic literature reviews in software engineering version 2.3. **Engineering**, 2007, 45(4ve), 1051.

LACERDA, L. F. B., & ACOSTA, L. E. Indicadores de Bem-estar Humano para Povos Tradicionais: o caso de uma comunidade ribeirinha na fronteira da Amazônia brasileira. **Ciências Sociais Unisinos,** 2017, 53(1), p. 100-111.

MARIDAL, J. H. A worldwide measure of societal quality of life. **Social Indicators Research**, 2017, 134(1), p. 1-38.

MINAYO, M. C. D. S., HARTZ, Z. M. D. A., & BUSS, P. M. Quality of life and health: a necessary debate. **Ciência & Saúde Coletiva**, 2000, 5(1), p. 7-18.

MINISTÉRIO DO MEIO AMBIENTE DO BRASIL Conheça o Painel Nacional de Indicadores Ambientais. **Relatório pioneiro consolida indicadores ambientais atualizados at & eacute**. 2014. Available in: https://www.gov.br/mma/pt-br/noticias/noticia-acom-2014-12-675. Access: 10.August.2021.

NERI, A. L., BORIM, F. S. A., FONTES, A. P., RABELLO, D. F., CACHIONI, M., BATISTONI, S. S. T., ... & LIMA-COSTA, M. F. Factors associated with perceived quality of life in older adults: ELSI-Brazil. **Revista de Saude publica**, 2018, p. 52.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT. **How's Life 2015**: Measuring Well-being. Oecd. 2015. Available in: <http://dx.doi.org/10.1787/how_life-2015-en>. Access: 26.July.2021.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT. *OECD* regions at a glance 2016 [Internet]. **Paris**: OECD. 2016. Available in: <http://www.oecd-ilibrary.org/governance/oecd-regions-at-a-glance-2016_reg_glance-2016-en>. Access: 03.August.2021.

ORTIZ BENAVIDES, E., & NÚÑEZ VELÁZQUEZ, J. J. Contributions for the construction of a global measure of poverty: The case of Colombia 2011-2017. **Desarrollo y Sociedad**, 2019, (83), p. 263-305.

PAGE, M. J., MCKENZIE, J. E., BOSSUYT, P. M., BOUTRON, I., HOFFMANN, T. C., MULROW, C. D., ... & MOHER, D. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. **Bmj**, 2021, p. 372.

PATRICK, R., SHAW, A., FREEMAN, A., HENDERSON-WILSON, C., LAWSON, J., DAVISON, M., ... & LEE, C. K. Human wellbeing and the health of the environment: local indicators that balance the scales. **Social Indicators Research**, 2019, 146(3), p. 651-667.

QUEZADA, P., CUEVA, R., & PAZ, F. A Systematic Review of User-Centered Design Techniques Applied to the Design of Mobile Application User Interfaces. In **International Conference on Human-Computer Interaction**, 2021, July, pp. 100-114. Springer, Cham.

RAMOS, H. F., NUNES, F. G., & SANTOS, A. M. D. Índice de áreas verdes como estratégia ao desenvolvimento urbano sustentável das Regiões Norte, Noroeste e Meia Ponte de Goiânia-GO, Brasil. **Cuadernos de Geografía: Revista Colombiana de Geografía**, 2020, *29*(1), p. 86-101.

ROCHA, L. A., RUFINO, I. A. A., & BARROS, M. N. M. Indicador de salubridade ambiental para Campina Grande, PB: adaptações, desenvolvimentos e aplicações. **Engenharia Sanitária e Ambiental,** 2019, *24*, p. 315-326.

SALGADO, M., MADUREIRA, J., MENDES, A. S., TORRES, A., TEIXEIRA, J. P., & OLIVEIRA, M. D. Environmental determinants of population health in urban settings. A systematic review. **BMC public health**, 2020, 20, p. 1-11.

SÁNCHEZ, Á., CHICA-OLMO, J., & DE DIOS JIMÉNEZ-AGUILERA, J. A space–Time study for mapping quality of life in Andalusia during the crisis. **Social Indicators Research**, 2018, *135*(2), p. 699-728.

SANTOS, D. Índice de progresso social na Amazônia brasileira. **IPS Amazônia**, 2014.
SICHE, R., AGOSTINHO, F., ORTEGA, E., & ROMEIRO, A. Índices versus indicadores: precisões conceituais na discussão da sustentabilidade de países. **Ambiente & Sociedade**, 2007, 10, p. 137-148.

SHAIKH, M., SALLEH, N., & MARZIANA, L. Social networks event mining: A systematic literature review. **Pattern Analysis, Intelligent Security and the Internet of Things**, 2015, p. 169-177.

SOUSA, T. F. D., FONSECA, S. A., VIEIRA, E. P., CHAVES, A. O., NASCIMENTO, J. V. D., & ALVARENGA, A. M. Validade de constructo da escala Condições do Ambiente e Características de Aprendizagem na Universidade (CACAU). **Avaliação: Revista da Avaliação da Educação Superior (Campinas)**, 2018, *23*, p. 665-678.

SRUTHI KRISHNAN, V. Impact of land use and land cover change on the environmental quality of a region: A case of Ernakulam district in Kerala, India. **Regional Statistics**, 2021, *2*, p. 102-135.

WANG, P., WEI, X., YINGWEI, X., & XIAODAN, C. The Impact of Residents ' Leisure Time Allocation Mode on Individual Subjective Well - being : The Case of China. In **Applied Research in Quality of Life** (Issue 0123456789). Springer Netherlands. 2021. https://doi.org/10.1007/s11482-021-10003-1

XIE, X., CHEN, Y., CHEUNG, S., & HUANG, C. C. Social Innovation and Health-Related Well-Being of Left-Behind Children: Evidence from an Intelligent Robot Project in China. **Applied Research in Quality of Life**, 2021. 0123456789. https://doi.org/10.1007/s11482-021-09995-7

Como citar:

ABNT

MIRANDA, A. da S. [et al.]. Systematic mapping of quality of life indicators: an analysis of dimensions for the Brazilian Amazon. **InterEspaço: Revista de Geografia e Interdisciplinaridade**, v. 8, e202205, 2022. Disponível em: <http://dx.doi.org/10.18764/2446-6549.e202205>. Acesso em: 28 out. 2022.

APA

Miranda, A. da S. [et al.]. Systematic mapping of quality of life indicators: an analysis of dimensions for the Brazilian Amazon. *InterEspaço: Revista de Geografia e Interdisciplinaridade*, *v. 8,* e202205, 2022. Recuperado em 28 outubro, 2022, de http://dx.doi.org/10.18764/2446-6549.e202205