

Mixed-use Developments and Urban Megaprojects in the Global South: A Systematic Review and Interpretation of a Blurred Intersection

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ABSTRACT

This article examines the intersection of two distinct strains of urban studies: mixed-use development and urban megaprojects, through a systematic review of literature. One strain focuses on integrating diverse uses and functions within a single space, known as 'mixed-use'. The other originates from the technical complexities of megaprojects adapted to architecture and urban design. The article seeks to address a gap in the literature by clarifying the conceptual yet geographical overlaps between these two strains, which often have broad, blurred boundaries; it proposes a novel framework for defining and interpreting the related literature at this conceptual intersection.

Keywords: systematic review, mixed-use developments, urban megaprojects, urban studies, global south

INTRODUCTION

The article explores the interrelations of two main topics: mixed-use developments, and urban megaprojects. The first topic appears in the literature within a variety of interpretations, meanings, and understandings. Several urban theories, originating from diverse perspectives of urban studies, describe the mix of uses at different scales and in different manners. Three interpretation of this term are recurrent and widely known: mixed-use as a feature in the existent urban scenarios (e.g. the mix of uses within a certain existent area), mixed-use as a prospected 'ideal' feature (e.g., the mix of urban uses auspicated by Jane Jacobs since the 1960s, or the one postulated by the New Urbanism theories since the 1990s), and mixed-use as a design feature (e.g., the mix of uses in a specific project, as theorized in the technical literature since the late 1980s; Urban Land Institute, 1987). The body of literature defining these three main declinations is wide and extensive, and characterized by a long-lasting need for further research on the academic, theoretical, and empirical fields (Rabianski et al., 2009).

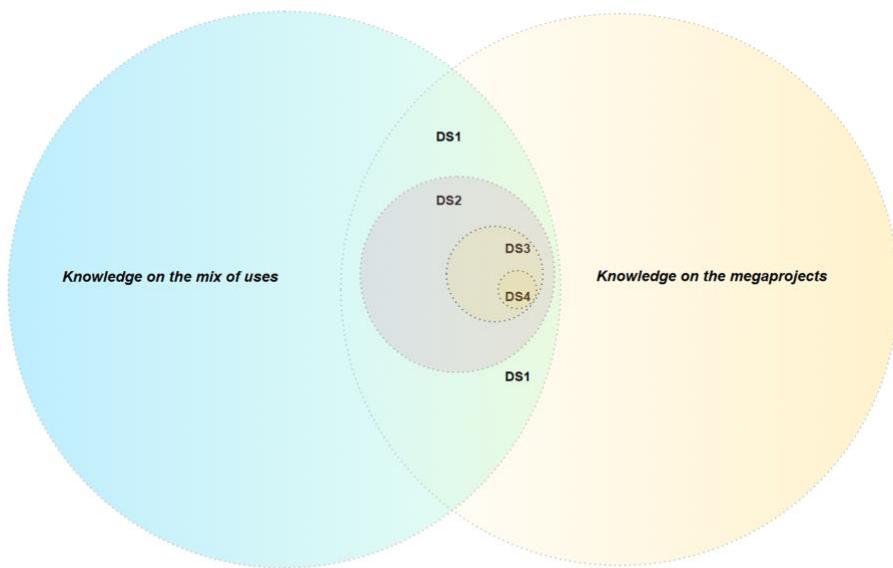
The second topic - urban megaprojects - has a path related to two strains of knowledge. The first, following its current definition (Jajamovich & Kozak, 2019), traces back to the engineering field of knowledge on megaprojects, formalized in the first decade of the 2000s by Flyvbjerg' studies (Flyvbjerg et al., 2003; Flyvbjerg, 2007), and by subsequent declinations such as Damayanti et al. (2018). The second, by the holistic critical political conceptualizations of Fainstein (2001) and her seminal studies for London. In the last two decades, the topic has diversified in different directions, with investigations focusing on the power relations underlying these projects (Swyngedouw et al., 2003), the urban implications in developing countries (Del Cerro Santamaría, 2013), and with a focus on and the balance between environment and human rights (Hawken et al., 2021), and the urban evolution of scale in the sites of developments (Talen, 2023)-. The specific

Southeast Asian literature on urban megaprojects in general has been influenced by various texts of McGee and Douglass and, more specifically, Olds (1995), and Dick and Rimmer (1998), who focused also on the international regional shifting economies and on the event of the 1997 economic crisis.

The existing understanding of how the mix of uses is integrated within urban megaprojects—and how, conversely, urban megaprojects are shaped, characterized, and distinguished by specific balances of uses—remains largely underexplored in the literature in the West—and Global North in general, richer of experiences and case studies—and in the literature of emerging country—Global South. This absence of references is not a mere conceptual remark, but rather a theoretical gap in the knowledge that emerged from the preliminary stage of research, and continued to be tangible during the various phases of the bibliometric analyses. Given the aforementioned diversity of approaches within these two topics, this intersection appears however 'blurred', as minimized and limitedly explained by the authors. The significance of this gap becomes particularly evident when considering the potential urban implications, especially in contexts where public-private partnerships are involved. The limited capacity for public comprehensive oversight, the concurrent 'real estate turn', and well-diffused push for the 'highest and best use' principle, privileging market-driven functions, would marginalize possible broader social goals, separate communities, and drive living expenses up (Fainstein, 2001; Shatkin, 2017). In contexts characterized by strong entrepreneurial urbanism, diverse sociopolitical institutions, and limited public regulatory capacity—such as those in the Global South and in the Association of South-East Asian Nations (ASEAN) region—greater critical awareness and scholarly attention to overlooked discourse rooted in the daily practices invisible to academia are urgently needed. Therefore, a conceptual intersection among the two topics is theorized to be existent in literature, and it is summarized in a diagram for clarity (Figure 1).

Figure 1

Conceptualization of the Research



Note. Two domains form the theoretical foundation of this article. Each domain comprises research, experiences, case studies, and other literature records, and have a broad and diverse extension which reflects the various theoretical perspectives found in each domain's specific literature (the Data Sets, DS_n). This article verifies this hypothesis, explores, defines, and investigates the intersection of these two topics in general (DS1, 2), and in the non-high-income countries (DS3), representing the Global South, and in the ASEAN (DS4) literatures.

The analyses conducted, described in the sections 2 and 3 and subject of this article, showed that the literature of the two topics has been systematically reviewed very limitedly, either as combinations of one of the two main topics of this research with others (Hübscher, 2021, researched megaprojects, gentrification, and tourism) or as individual literature investigations on single aspects. Damayanti et al. (2018), analyzed the complexity of the megaprojects; with an architectural perspective, Generalova and Generalov (2020) investigated the mix of uses in high-rises with a semi-systematic approach. Denicol et al. (2020) focused on the systematic focus of the megaproject performance. Kim (2023) deepened the knowledge on the theoretical aspects of large scale urban development. Stefano et al. (2023) researched the supply management of megaprojects supply chains. Further limitations emerged from the existent literature, as the fragmentation of the sources, their relatively young appearance in the studies, and the Western-focus in the analyses noted by Kim (2023); other recent contemporary authors urge

for more investigations especially in regards of overlooked contexts (Rek-Woźniak, 2023; Zeković et al., 2018). This absence of a consistent body of bibliometric analyses in literature and the lack of texts studying the intersection previously defined in Figure 1 emerging from the theorization phase of this article add to these factors. All these issues define a research gap this article aspire to answer the research question: How to delineate and frame the intersection of these two knowledge areas by examining existing literature on mixed-use in large-scale urban megaprojects and developments by investigating it at different scales?." The primary objective of the article is to verify, the existence of this conceptual intersection, to delineate and frame it, and to investigate it through a systematic literature review on a global scale, employing bibliometric analysis. A secondary objective is to analyze the presence of related practices, discourses, and bibliometric relationships within a broad geographic horizon, known also as the Global South, assessing their significance in the global academic literature. The final objective is to

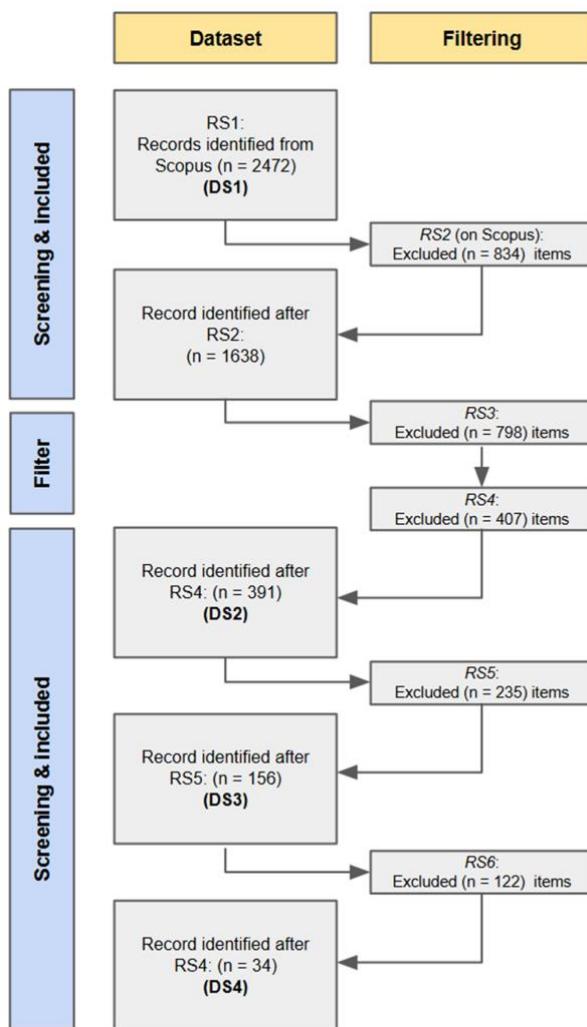
identify in the ASEAN region emerging trends and leading topics within the reviewed literature, also with the support of a novel interpretative framework. The research interest in the Global South and in the ASEAN region as overlooked territories is motivated by the rapid and uneven urbanization of these regions, paired with resourcing, capacity-building, partnership and vision issues, socio-economic inequalities (Association of Southeast Asian Nations Secretariat [ASEAN], 2022a; United Nations Human Settlements Program (UN-Habitat), 2016) and the presence of diverse non-high income countries (World Bank, 2024). On top of this well-known situation, grey literature and regional supranational urbanization strategies (as the ASUS, ASEAN Sustainable Urbanization Strategy; Association of Southeast Asian Nations Secretariat [ASEAN], 2018) underplay the diffusion of mixed-use developments and urban megaprojects in capital (mega) cities. This phenomenon has existed since the 1990s; for instance, Kuala Lumpur's Petronas Tower and Tun Razak Exchange and Bangkok's Bayoke Tower and One Bangkok in the Central Business Districts create seldom shopping districts (McGrath, 2006) and socioeconomic polarization that influence factors as land use and lifestyles (Denpaiboon et al., 2018). Furthermore, walkability and daily habits (Janpathompong et al., 2022) are impacts, as well, among others. Academic interest and overarching holistic goals are therefore tools to construct awareness towards these topics in regards to the aforementioned blurred intersection and to advocate for the clarification of these impactful diffused and unstudied interrelationships.

The research answers are investigated in section 3 and discussed in section 4 with the elaboration of a novel framework of interpretation for the ASEAN region before the conclusions of section 5. In section 2, the methodology followed for the investigation of the three objectives is illustrated.

RESEARCH METHODS

The systematic review of the existent literature is composed by quantitative and qualitative bibliometric analyses conducted with a tailored mixed-process of analysis. The mixed-process is made by six iterations of research, investigation, filtering phases (each iteration denoted RS_n, where 'n' represents the number of steps), and selection of four datasets (denoted as DS_n where 'n' represents the number of the dataset). The first two RS are conducted on Scopus and the others have been conducted on Microsoft Excel. Each dataset has been analyzed with the freeware bibliometric analysis software Biblioshiny, a freeware ShinyApp developed by Bibliometrix as a R-tool extension (Aria & Cuccurullo, 2017).

The graphic summarization of the process (Figure 2) arises from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for reporting and analyzing (Page et al., 2021a; Page et al., 2021b), scoping reviews criteria and checklist (Tricco et al., 2018). However, the methodology here implemented presents a reorientation of the protocol towards urban studies to better address the topic of this research, which is different from the disciplines in which the PRISMA method originated. The intermediate results of the iterative process (as the DS_n) are both results per se (and are analyzed in the following section) and the objects of further analyses as well (as bases for subsequent datasets). The rationale of the iterative research strategy is to reduce inconsistent and incoherent results, misleading terms, 'false-friends' publications (as publication which adhere the filters, but are unrelated to the research objective for various reasons, e.g. their unrelated field of knowledge), and the potential limitation of the authors' biases related to the interpretation of the texts.

Figure 2*Flowchart of the Research Process*

The first step of the strategy is the selection of the sources, e.g. bibliometric records obtained from a database. The Scopus database was selected due to its licensing package available to the researchers and for its wide coverage of the urban disciplines. The RS1 consists of scoping of the database, in which every record had to meet the eligibility criteria expressed by a research query that allowed the inclusion of any publication which contained at least 'mixed-use' or 'megaproject development' (with their possible spelling variations) within the timespan of 1983-2023 in all language and with reference to disciplines inherent to the built environment including social, engineering, environmental, earth, decisional, and business sciences, as well as art and humanities and multidisciplinary subjects. The timespan selected comprehensively covered the literature main

points mentioned in the introduction and the progressive database standardization of the database records, thus allowing a complete observation of the literature existent.

The 2,472 records collected formed the DS1. This large pool of texts is valid for gauging the general positioning of the topics in the literature, but it is too broad to satisfy the research objectives.

Consequently, another filtering of DS1 (RS2) was performed in Scopus with a finer query aimed to exclude a large number of texts connected to fields relevantly misleading for this research, such as the study of the energetic sources and systems. Furthermore, texts were limited to the discipline dominion of social sciences, engineering, arts, and economy in English language only. The result is 1,638 texts, most of

which are still too generic and broad to be considered a dataset in themselves. The refinement process RS3, executed in a .csv Excel file, reduces the items with the help of specific keywords, crossed-inter database research, including both inclusion and exclusion criteria. This semi-structured decisional process provided 840 items, addressing the conceptual intersection at the core of this article still too broadly. A stricter filtering semi-structured step was thus established, similar to the RS3, but with the support of bibliometric analysis conducted on the datasets to strictly crossmatch the results.

This led to DS2, composed of 391 items, and constituting the main intersection among the two topics at the root of this research. DS2 does not include a geographic or economic discrimination based on the status of the development of a country. The introduction of a metric to operate the geographic division requests further elaboration, since this division, identified in the common language as the Global North and the Global South divide, has progressively been deemed discriminative (United Nations Statistic Devision [UNSTATS], 2021), and from 2022 onwards, it depends on a country's self-classification as being "developing" or "developed". This revised listing substitutes the previous "North / South" divides executed during the years by the various UN agencies (United Nations Statistic Devision [UNSTATS], 2022). Its usage for the purposes of this research poses limitations and theoretical incoherences. Firstly, the list is influenced by political self-assessment decisions; it marks as 'developing' countries, territories, and cities-states with significant experience in mixed-use urban design and development, such as Hong Kong and Singapore, and in megaprojects, such as Qatar, Saudi Arabia, and the United Arab Emirates, listing them in the same collection of less urbanized countries and territories. To adopt a definition more fitting to the topics investigated and to the scope of the research, after several evaluations of different methods that maintains this socio-economic world divide (e.g. the International Monetary Fund's "Advanced Economy List"), this research employs the World Bank's 2024 classification of high-income countries. This classification lists as 'high-income' countries and territories with a gross national income per capita (GNI) of 14.005 \$ (World Bank,

2024), and it is deemed fitting for three reasons: (1) It focuses on non-macroeconomic aspects and 'long-term economic development' (World Bank, 2024); (2) it is worldly comprehensive, sorting the other countries outside of the 'high-income' in other brackets ('low', 'lower-middle', and 'upper-middle' income); and (3) it is grounded in economic data collected and harmonized from a globally recognized institution, following a clear methodology (World Bank, n/a; Metrau et al., 2024). The classification includes the aforementioned countries and leave outside diverse countries all over the world including part of the Balkans (as Serbia) and Eastern Europe (as Belarus and Ukraine), South America (as Brazil and Argentina), Western Asia (as Turkey), Eastern and Southeast Asia (as Thailand and China), and Africa. China, Serbia, Brazil, Argentina, and Turkey present diverse literature records in regards of urban megaprojects; this allows a clearer understanding of the instances presented in the so-called Global South.

Following this geographic criteria, RS5 analyzed authors and affiliation and the subject of every text. The presence of texts from and about non-high-income countries determined the inclusion or the exclusion of an item. In the case of a group of authors with diverse affiliations, the most predominant country of affiliation of a team determined the inclusion or the exclusion of the item. This process formed the DS3 composed of 156 items. DS3 identifies the literature on the topics in the non-high-income countries, known colloquially also as "the Global South".

A final selection is operated by creating a group with the specific academic production from and about the ASEAN Countries. As per the aforementioned non-income country bracket, Singapore and Brunei Darussalam are, in the categorization chosen, the two only ASEAN countries recorded as high-income (so, excluded by the DS3). Due to the nature of the developing economy and its status of 'observer' (ASEAN, 2022b), Timor Leste has been added in the research to further expand the scope. With this consideration, the DS4 is obtained and amounts to 34 items. Notably, this selection excludes the extensive Chinese academic production, allowing a calibrated focus on regional specific issues and topics.

Summarizing, the study selection produced four datasets through various filters:

- DS1 (2472 items) evaluates how the topics object of the research position themselves in the literature. It is a large field of intersection which shows comparison with other disciplines and within the various strains of literature existing in the built environment.
- DS2 (391 items) serves to identify the specific insights existing in the literature without any geographical distinction.
- DS3 (156 items) shows how many articles of the topics of the research come from (and speak of) countries with a non-high-income (referred to often as “the Global South”).
- DS4 (34 items) provides a quantification of the ASEAN quota of texts.

The quantity of possible analysis realizable for every dataset is quite numerous. Each of the dataset can be analyzed bibliometrically under one level of general quantification (‘overview’), four “levels of analysis” (sources, authors, documents, clustering), and three “structures of knowledge” (conceptual, intellectual, and social structures); each has different general (as ‘keywords’, ‘keywords plus’, ‘titles’, ‘abstracts’) and specific metrics (as for instance ‘monograms’, ‘bigrams’, etc.) and computing methods. Moreover, all the categories have other subclasses of analysis. At the same time, a single set of analysis (as, for instance, ‘clustering analysis’), is not sufficient to satisfy a research objective. To avoid redundancies, for brevity, and to satisfy every objective, a combination of different datasets, overview data, levels, and structures is selected, differentiating the metrics analyzed time by time. Given the limited number of records of DS4, an explicative table of contents complete the discussions of the results and the pursuit of the third research objective.

The following section describes the analyses conducted in the Biblioshiny application to answer the research questions.

RESULTS

Definition and Investigation of the Topics’ Intersection

A study of the ‘co-occurrence’ method studies the conceptual structure of a dataset. The DS1 shows how every author’s keyword, a node, has a size proportional to its occurrence. The connectors are edges, whose size is proportional to the item’s occurrence; the thickness of each edge is proportional to its strength – how strong are the relative occurrences and co-occurrences (Aria & Cuccurullo, 2017). Figure 3 shows three clusters: (a) ‘megaprojects’ and related topics, (2) ‘mixed-use’ and related topics, and (3) various urban topics with less recurrence. In the last two clusters, the dimensions of the nodes, their peripheral position, and the strength of the links appear weaker than the constituted body of the main cluster, e.g. the megaproject. Considering that DS1 includes several items referred to other fields, as engineering, it is possible to state how the division existent in the two main strains is backed up by a bibliographic consistency at large. It is remarkable to note the cluster around the ‘transit-oriented development’ is connected to the mixed-use one, indicating the nesting of the topic into the DS1 as a sub-category.

This clustering is reported also in another analysis - the ‘thematic map’ - executed on the conceptual structure of the DS1. The score of each cluster positions the topics in distinct quadrants. The well-established and ample topic of the ‘mixed-use’ it is defined as a motor theme in the dataset. The cluster of ‘urban development and urban megaprojects’ appears as basic theme, with a more consolidated presence in literature. The topic of ‘megaproject and infrastructure’ position itself as a niche theme. The topic of ‘project management and megaproject’ as an emerging rather than declining term, given the recent publication dates of the items included in this cluster.

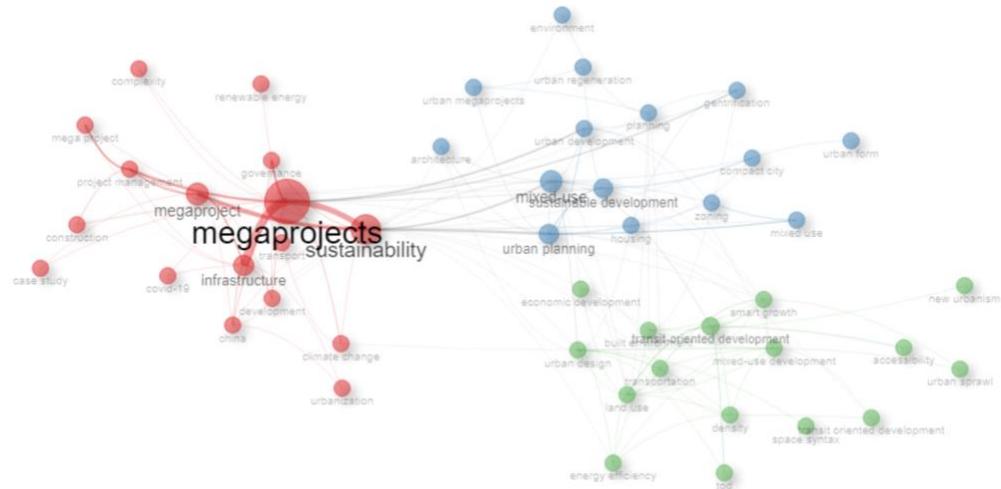
The analysis of more granular data confirms this trend. A study of the ‘factorial analysis’ (conceptual structure) and on the correlations of author’s keywords and documents (publications) on the DS2 shows this clustering and a division occurring in a similar manner (Figure 4). The closer the distance among the terms, the higher

the use of the two in conjunction. A cleaner dataset with less results unrelated to the main topics of discussion shows the existence of three main clusters. The central cluster, in red, contains the main correspondence among the main topics of the article, which include mixed-use development and urban megaprojects and are presented with different spellings within the area of the cluster. The relevance of the other clusters to the research is secondary.

The clustering appears evident when generating a word cloud from the same dataset DS2 (Figure 5), which expresses qualitatively the contribution of each word in a given dataset. ‘Mixed-use development’ and ‘urban megaproject’, the theoretical topics at the base of this research, have the same occurrence in the dataset analyzed.

Figure 3

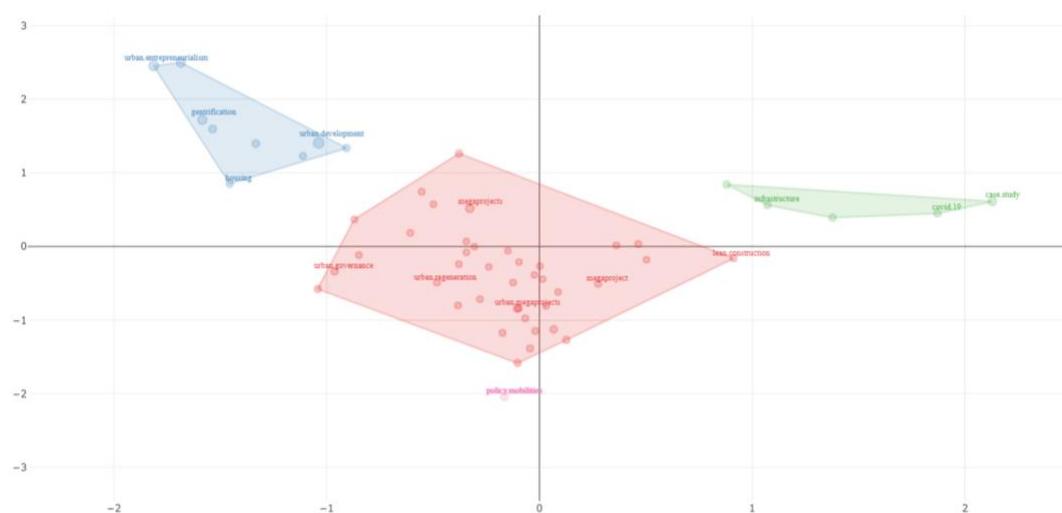
Conceptual Structure, 'Co-Occurrence' Study Executed on 'Author Keywords' on DS1



Note. Figure produced by the authors using Biblioshiny freeware software.

Figure 4

Conceptual Structure, 'Factorial Analysis' on DS2, 'Author's Keywords'



Note. The emergence of the keywords ‘urban governance’, ‘urban regeneration’, ‘megaprojects’, ‘urban megaproject’, ‘megaproject’, and ‘lean construction’ imply their usual conjunct usage. Figure produced by the authors using Biblioshiny freeware software.

Figure 5

Document Analysis, 'Wordcloud', 'Titles' (Bigrams) on DS2



Note. The generic bigrams 'urban development', 'urban planning', and 'sustainable development' have been omitted from the analysis in order to provide a clearer visualization of the results. Figure produced by the authors using Biblioshiny freeware software.

From this image, the diffused presence of 'development', 'construction', 'waterfront', and the minimal presence of 'mixed-use' emerge. This underpins the lack of attention by the academia to the topics and the lack of scholar discussions of how the mix of uses is framed in literature. The selection of analysis shown is sufficient to demonstrate the conceptual intersection of the two topics of the research, respondent to the first objective.

Practices, Discourses, Bibliometric Relationships in the Global South

The second objective refers to a deep assessment of the two different broad geographical yet developmental horizons intended commonly as Global North and Global South. While recognizing this geographical yet socio-economic divide, and with the aim of shedding light on how these topics remain marginally addressed by academia in contexts that urgently require greater awareness of such urban dynamics, the analyses are carried out with scoping the DS3.

The publications analyzed at the level of overview analyses highlight their recent origin

with two main considerations. The first article included is Olds's seminal research on Pacific Rim megaprojects (1995). The bulk of the literature is composed by a small number of main researchers with a relatively short but still undergoing productivity as undergoing productivity as Li Y., Wang T., and Le, Y. These authors share the same affiliation in China, the Tongji University, and characterize the dataset composition altogether with Perić A., the only European researcher included in the top 10 most relevant authors, although appearing with affiliation from both high-income and non-high-income countries (namely Switzerland and Serbia). Extending the scope of affiliations and nationalities, it shows how China has the lion's share of countries' scientific production (141, vs the 35 of the second country being the United States of America), as a sum of articles with correspondent authors (38 in total, of which 23 as a single-country text and 15 as multiple-countries text), with the second country having less than the half of the results in all cases. In short, a few authors —predominantly with Chinese affiliation— influence a relatively young literature strain (the intersection between megaproject and mixed-use development in the Global South). High-income countries' authors write mostly about non-high-income as main correspondent writers, while the opposite, even if in a smaller number of items also emerges. Writers affiliated

to developed countries write mostly about developing or under developing ones as secondary authors. A further study on the social structure of the dataset highlights how these few authors have relatively little collaborations among themselves. The analysis performed on the 'collaboration network' evidence limited connections among the authors included in the dataset. It is remarkable to mention that the total academic production on the topics researched by authors affiliated with universities from countries of the Arabian Peninsula in the DS2 accounts, in sum, as the eighth country in the academic production. With the filtering of the countries of the DS3 and their subsequent exclusion, this sum becomes even marginal, despite the presence of well-researched phenomenon of urbanization as the 'instant city' (Bagaeen, 2007), or urban megaprojects (e.g., Rizzo, 2020).

Analyzing the references, the three-field plot (Sankey diagram) of Figure 6 provides a general quantification of research paths (the most quoted references on the left column), the current authors (quoting the most recurrent references), and their outputs (identified as the keywords they used). In this way, this figure highlights the fragmentation of a relatively few widely-known sources of both the mix of uses and the megaprojects (an area heavily influenced by Flyvbjerg's publications) and the research output, in which megaproject and megaproject management accounts for more than the half of the research keywords. The study on the mix of uses in megaproject or large-scale developments does not account in the first fifteen keywords used, while "urban megaproject" appears to be the fourth most used research output. This finding reinforces the notion of 'blurred' intersection among the topics of interest and the research gap from the perspective of the authors from non-high-income countries. In other words, this insight highlights how main Global South authors of the topics relates to the main international literature of the topics, and how.

The details of the 'intellectual' level of investigation (the 'inputs' of Figure 6) are shown in Figure 7, which highlights the limited co-citations of the dataset. Two documents are co-cited when a third document cites the both of them. The cited documents are defined as 'references', and they can be external to the collection analyzed (Aria & Cuccurullo, 2017).

This diagram offers four main results. The main cluster (in purple) represents the bulk of the specialized literature object of the research. Three texts written by Flyvbjerg (2003, 2014, 2017) are the main nodes and, in two occasions, these are connected to Shatkin (2008, 2011); both authors are connected, at their turn, to Swyngedouw et al. (2002, 2003; identified as 2002-1 and 2002-2 in the figure). Secondly, the texts are connected to the other reference to other seminal texts, as pointed out by Altshuler and Luberhoff (2003), Lehrer and Laidley (2008), and the more recent Rapoport and Hult (2017) in regards of sustainable instances. Thirdly, other relevant texts such as del Cerro Santamaria (2013) and Fainstein (2008) strengthen the bonds within this cluster. Then, remarkably, Douglass (2002) and Olds (1995), foundational authors for the regional Southeast Asian urbanization, are marginal compared to the main cluster.

Similarly, the same bibliographic collection is studied also in reference to 'global' and 'local' citations. 'Global' are defined as the documents cited by other authors in the global literature; 'local' as the documents included in the collection analyzed (Aria & Cuccurullo, 2017). The most globally and locally cited document is, in absolute number of citations, Shatkin (2008), which provides a comprehensive view on the discussion of urban megaprojects in Southeast Asia. The third most locally cited document is also the third most globally cited; Hu et al. (2015), which provides an extensive literature review on managerial aspects of the megaproject developments. Remarkably, Hu et al. (2015), Shatkin et al., (2019) are the only researchers who appear in both tables. Shatkin is however the only author who appears with two texts (Shatkin, 2008, 2017) in both global and local top-10 charts. This results show how authors of the Global South are mutually influenced by their writings.

An analysis on the conceptual level partially shows the division among the main two topics theorized in this research and observed in DS1, and in Figure 3. A less marked division among the co-occurrence of the 'author's keywords' is visible in Figure 8. Again, this separation is conceptual yet bibliometric: the bolder and closer the edges, the stronger is the link among certain words; the larger and the more the nodes, the

stronger their relevance in the dataset. A main cluster (in red) contains the core of the most relevant keywords included in the 156 abstracts analyzed; a secondary cluster (in green) contains elements of definition of the megaproject's knowledge. A minor cluster (in blue) links together urban megaprojects and capitalist globalization to the previous two clusters.

Similar to Figure 4, a factorial analysis is conducted on the DS3; it analyzes the DS3 conceptually, but with another method and scoping abstracts (bigrams) of DS3. Results indicate several clusters relevantly spaced among themselves, revealing also a conceptual distance. Table 1 lists the more recurrent coupled words present in the three main clusters.

Trends and Topics in the ASEAN Region

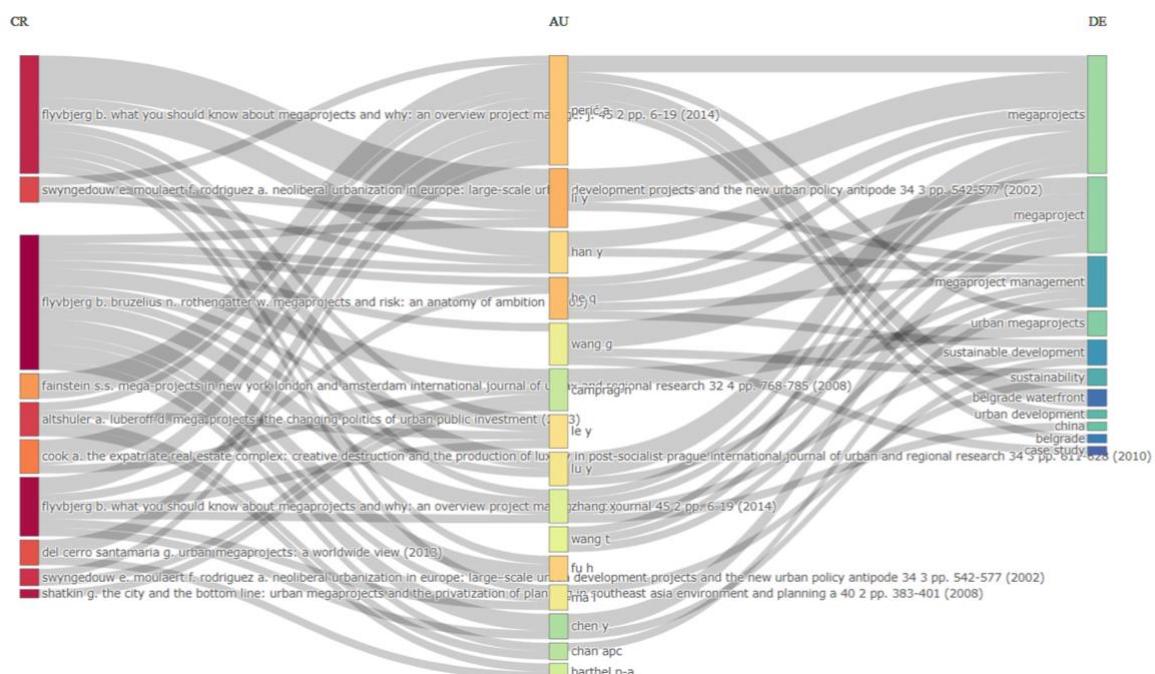
The third objective refers to the trends of the ASEAN region to see more detail how this world region's academic knowledge addresses the intersection between mixed-use and urban megaprojects. The limited amount of texts present in the DS4 (34 articles) limits meaningful bibliometric analysis. Considering these limitations, quantitative investigations on the documents are the first to be executed.

The word cloud gathering (Figure 9) does not show any mainly prevailing word, in all possible combinations executed (combinations of author's keywords, keyword plus, and titles, with monograms, bigrams, trigrams). This underlines the fragmentation of interest of the regional authors.

These references represent the connecting bases that nest and position the selected bibliographic collection in the literature.

Figure 6

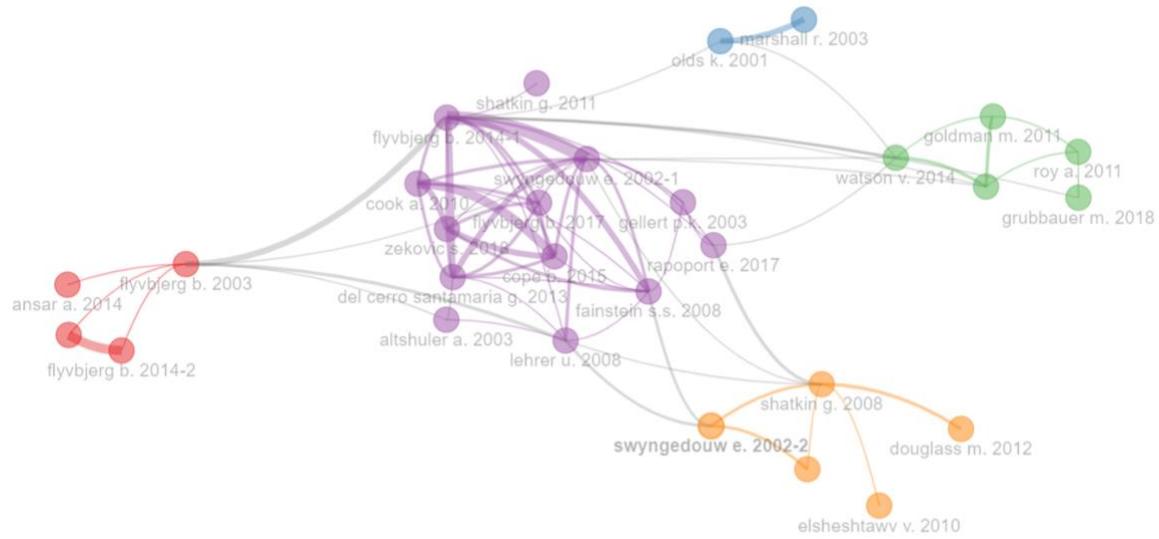
General Quantification. 'Three-Field Plot' on DS3



Note. The columns represent the 15 most relevant references, authors, and author's keywords (from left to right). Figure produced by the authors using Biblioshiny freeware software.

Figure 7

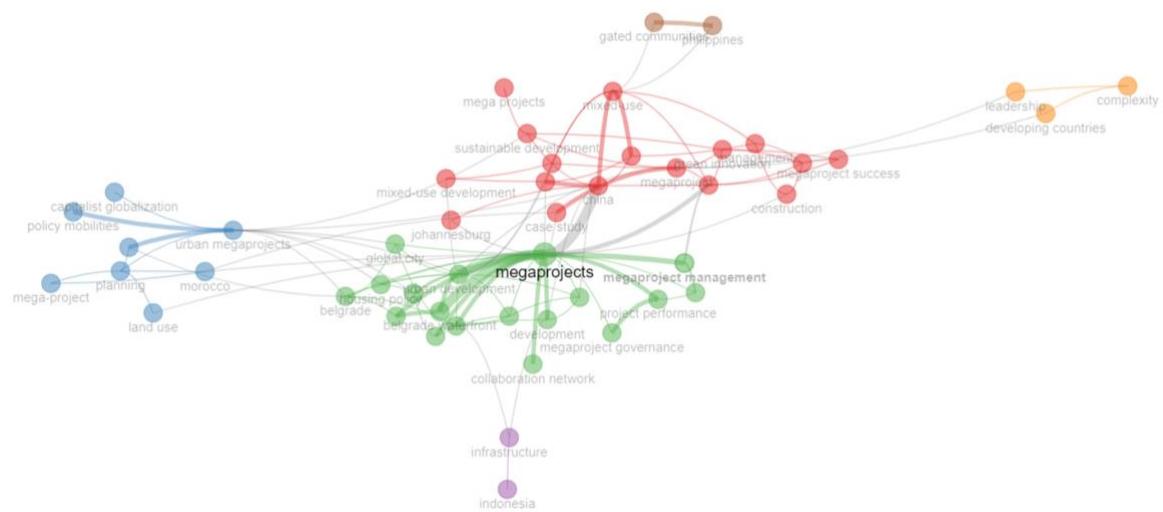
Intellectual Structure of Knowledge, 'Co-Citation', 'Papers', on DS3



Note. Figure produced by the authors using Biblioshiny freeware software.

Figure 8

Conceptual Structure, 'Co-Occurrence' Network, 'Keywords Plus' on DS3



Note. Figure produced by the authors using Biblioshiny freeware software.

Table 1

Word Composition Within Each Cluster

Cluster	Words
1	'urban development', 'mixed-use development', 'urban planning', 'sustainable development', 'Chinese cities', 'mega project', 'private sector', 'urban governance', 'urban space', 'urban studies'
2	'megaproject management', 'future research', 'social network'
3	'real-estate', 'urban megaprojects', 'global south', 'development projects', 'large-scale urban', 'urban developments'

Note. The table is derived from an analysis on the conceptual structure, 'factorial analysis' on DS3, 'abstract' (bigrams).

Figure 9

Document Analysis, 'Wordcloud', 'Author's Keywords' on DS4



Note. Figure produced by the authors using Biblioshiny freeware software.

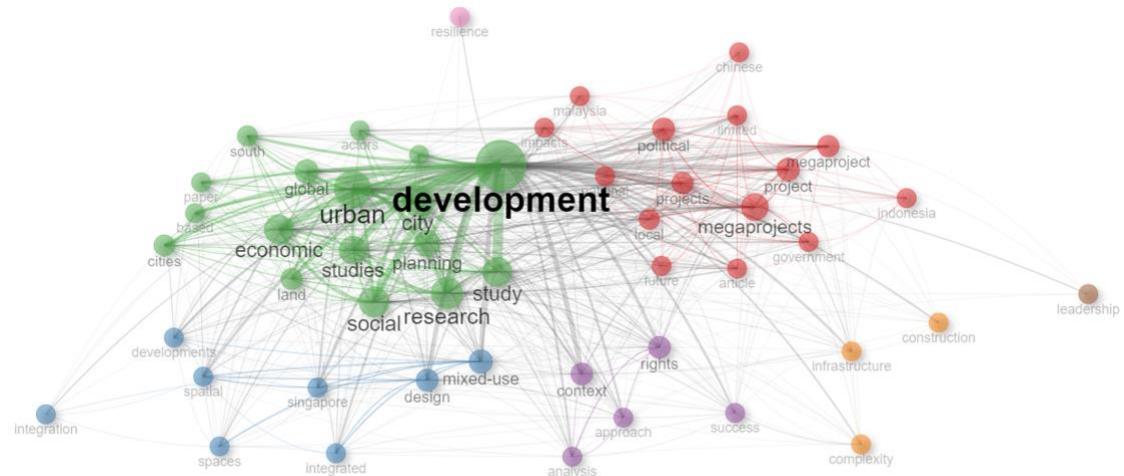
Similarly, the study on the social structure of the dataset, or the 'collaboration network', highlights a map of disconnected clusters of writers, meaning lack of co-writing and shared authorship in the region. This pairs with the result expressed in figure 9.

The conceptual investigations, and specifically the factorial analysis executed on the DS4, manifest lack of prevailing themes; combining the bigrams of the abstracts, the only clusters existent is "global south"-Australia'-Manila'-'private sector", with limited value and more related to the single case studies.

As per the previous dataset, the co-occurrence of author's keywords provide the measure of what science talks about. Analyzing the abstracts and the monograms, the results appear more stratified although influenced by the limited number of entries (Figure 10), indicating various research horizons in which the topics of the mixed-use urban megaprojects are subordinated to the topic of the 'development'. Mixed-use are connected to the megaprojects through a generic collection of keywords linked to developmental instances, reporting the fragmentation previously mentioned in the text.

Figure 10

Conceptual Structure, 'Co-Occurrence' Study Executed on 'Abstracts' (Monograms) on DS4



Note. Figure produced by the authors using Biblioshiny freeware software.

Lastly, the study of 'local' and 'global' citations render a situation similar to the one previously discussed in regard to the DS3. In the DS4, Shatkin (2008) constitutes both the most 'global' and 'local' cited documents, indicating its relevance for Southeast Asia. Huynh (2015), Hanakata and Gasco (2018), and Rizzo (2020) are altogether with Shatkin the only authors to appear in both top ten tables.

The answer to the third research question - the identification of emerging trends and leading topics in the ASEAN region - appears to show, beyond the aforementioned fragmentation, an interest in raising developmental issues, a diversity of approaches to urban planning, care about infrastructure development and project management, but a marginal interest in the two topics at the base of the research. A further definition of trends and emerging topics from the dataset is discussed at the end of the following section.

DISCUSSION

The interpretation of the results starts considering the theoretical bases of the research, going beyond the mere result obtained and developing novel geographical interpretations of the results. The foundational works of Swyngedouw et al. (2002), Moulaert et al. (2003), and Shatkin (2008), the broadening of the scope

operated for peripheral cities (Ong, 2011; del Del Cerro Santamaría, 2013), and the theoretical frames identified by Hanakata and Gasco (2018), and theoretical frameworks (Kim, 2023), defined a base of knowledge partially met by the results found. This discussion analyzes implications and limitations of the evidence found. In its final part, the results are reconnected to the aforementioned base of knowledge with Table 2.

The analyses of Figures 3, 4, and 5 - namely co-occurrence, factorial, document quantification - used for the first objective show the nature of a broad, large, and non-specific intersection between the topics, although not fully related to the scope researched. It is possible to observe also how the topics of interest are not central in the current specialized literature visible in the DS1 and DS2. The assessment of practices, discourses, and bibliographic networks existent is conducted analyzing DS3 and DS4 as valid to express the importance of the findings for Global South and ASEAN region. The general quantification of authors, number of texts, years of production, and the affiliations, drew the main state-of-the-art of a young literature strain, driven quantitatively by a few countries. The role of Chinese authors and the attention to megaprojects coming from authors affiliated with universities from the Arabian Peninsula despite the small number of records driving the literature's consistency cast different lights for the interpretation of the academic production in world

literature, dwarfing the results coming by other regions of the world as the ASEAN. The production of papers from and about the non-high-income countries reveals three further aspects, when we equalize to these terms the label Global North and Global South: (1) the presence of main authors from universities of the Global North in developing research and case studies in the Global South ones, (2) the role of universities in the Global South is distributed equally as main and secondary authors, and (3) only in one case (Yehia, 2022), a paper from a country from the Global South investigates a case-study in the Global North. These last two topics offer base for further reflections on the role of autochthonous, 'imported', and local academic production in the Global South, which fall outside of the scope of this research. Nonetheless, these reflections would enrich the discourse and construct a critical local scholarship on the matter, with all the related implications for future policymaking.

Figure 6 provides the qualitative continuity on the authors' sources and their research outputs. Limited inspirational researcher writers well rooted in the technical literature (as Flyvbjerg) or other pioneers in the definition of the megaproject topic (such as Altshuler & Luberhoff and Fainstein) drive the majority of the inspirations for the authors included in the DS3. The presence of critical political economy cornerstones (Shatkin, 2008; Swyngedouw et al., 2002) complete the definition of the research roots. The outcomes, measured on author's keywords, are oriented towards the definition of aspects of the megaproject development, such as management and performance. The study of the intellectual roots defines another aspect. In Figure 7, the connecting points are denser in the central cluster, the main concentration of the intellectual structure of the discipline, displaying a threefold informal structure: a core with various nature influenced by Flyvbjerg, Fainstein, del Cerro Santamaria, connected to the exterior by other similar homogeneous documents which connects, at their turn, more specialized clusters of references. More recent documents, as the ones written in the 2020s, do not figure in the visualization due to their minor relevance and influence in the literature, affected by a core set of references spanning across the decade 2005-2015.

Data emerging from the analysis of the 'global' and 'local' citations materialize the connection with the theoretical root of the intersection of the topic researched, and its relevance inside and outside the dataset. The emerging texts remark the predominance and influences of Shatkin texts (Shatkin, 2008, 2017). Hu's text (Hu et al., 2015) show instead how the engineering approach to the megaproject is part of the root of the discipline and how it can be conveying a broader message. The lessons learnt from the text's case studies contribute to the knowledge of the urban megaproject as well. The other relevant text (Grubbauer & Camprag, 2019) poses reflections on the neoliberal city developments dynamic in a case-study, the Belgrade waterfront redevelopment in the post-soviet city, covered by other seven texts (as Zeković et al., 2018).

The comparison among the two co-occurrences of Figures 3 and 8 is possible, although the first uses 'author's keywords', and the latter 'keywords plus' in order to keep the same level of accuracy in the two datasets. Being these two similar methods, the key difference is constituted by the datasets, since DS3 is derived from DS1. The three main clusters have smaller dimensions than the previous ones, and a narrow spacing between them. The most significant links reveal the conceptual structure of the literature: 'megaprojects' is strongly tied to 'China', underpinning what previously said in regards of the production; 'urban megaproject', to 'megaprojects' and to 'mixed use developments', indicating its nature of a sub-topic. A deeper more integrated analysis of these aspects, taken individually or as a whole, would constitute future leads of research involving, as well, the geopolitical dynamics of power existent in the megaproject development and their description, and the prolific field of quantitative study of these analysis fall however outside the scope of this research. The clustering of Table 1 faces from another angle the conceptual structure of the dataset, revealing extensively what the abstract of the 156 texts mention.

Final considerations on the third objective warrant further discussion. While the word cloud provides a quantitative overview, it is insufficient to comprehensively represent the existing literature. Secondly, the generation of qualitative insights is constrained by the analysis of social structures, as per the fragmented and non-

collaborative nature of academic authorship. Thirdly, the co-occurrence study of the abstracts suffers from the lack of bibliometric data, demonstrating the subordination of the research topic, in the ASEAN region, to the main recurrent keyword of 'development'. Lastly, the remarkable relevance of the texts by Shatkin (2008), Huynh (2015), Hanakata and Gasco (2018), and Rizzo (2020), is not sufficient to define emerging topics specifically.

Therefore, given the aforementioned reasons, the discussion of this article concludes with an interpretation of the texts included in the DS4 with the construction of an experimental interpretative framework of analysis here developed the 'theoretical and analytical framework' (Table 2), which contributes to the third objective of the research.

A Theoretical and Analytical Framework

On the Y-axis in Table 2, the 'analytical frames' rows interpret and tailor the categories of analysis of Hanakata and Gasco (2018) for the study of the '*grand projects*', large-scale urban developments studied extensively in Europe, Southeast Asia and Eastern Asia. This reference observes built case-studies and rather than theoretical works, defining five research frames associate with mixed-use project development stages. Therefore, to address the scope of this research, we adapt these frames adding an 'about' before each specific factor listed. For example, a paper which discusses the design of a building or some aspects of the design, would go on the row 'about design'. The table is composed of the following frames: 'about conception' refers to papers which discuss the conceptual stage of a project, or any texts which discuss the conception stage in general. 'About design' refers to papers focused on the design process, or practices. 'About implementation' indicates papers about construction and development. 'About operation' refers to items which take into account the operational stages of a project. 'About implication' refers to the broad range of studies which focuses on the implication of a project, or of a factor of it. For the scope of this text, an extra frame 'others', is added for papers which do not fit on any of these previous

categories, as books (Shaktin, 2017), introduction chapters (Bovensiepen & Meitzner-Yoder, 2018), or new theoretical frameworks (Hanakata & Gasco, 2018).

The columns listed on the X-axis are instead derived by Kim's four main theoretical frameworks. The reference, included in the DS3, categorizes extensively and systematically western literature on the mixed-use-large-scale urban developments and urban megaprojects in these four groups. 'Critical political economy,' which critiques capitalist urban development (Kim, 2023, p.173) and references texts that analyze multiple factors in city-making (Wells & Lamb, 2022); 'Urban politics and regime theory,' rooted in the 'elitist pluralist debate' (Kim, 2023 p.175), focusing on power dynamics; and 'Alternative theory,' which refers to texts outside the previous categories, using an inductive approach to theory-building (Kim, 2023, p.181) with diverse sub-theoretical frameworks that go beyond case study discussions to develop theoretical elements. 'Critical pragmatic' addresses cases that do not align with other frameworks, forming alternative positions that could bridge the gap between academic research and planning practice (Kim, 2023, p.181). An additional category, 'others,' includes uncategorized texts such as quantitative analyses (Sinthalapadi Srikanth et al., 2022) or literature reviews on cutting-edge topics (Damayanti et al., 2021). These frameworks are adopted by the author due to space constraints in this research.

After a complete read and a critical evaluation of all the 34 items of the collections, all the documents are positioned in the most suitable intersection of analytical/theoretical frameworks. In reference to what said previously in regards to the affiliation of the authors, the table additionally distinguishes writers affiliated with universities located in ASEAN (18) and not (15). In one case (Marshall, 1998), it was not possible to define the affiliation. The presence of authors from ASEAN (counted as main, or as the sum of secondary authors) highlights a situation different from the one identified for the DS3 in the discussion; in other words, ASEAN literature tends to be produced by a large presence of local authors, with a remarkable presence of external authors. The blanks in the boards indicate gaps in the literature.

Table 2*The Theoretical and Analytical Framework.*

Theoretical Frameworks						
		Critical Political Economy	Urban Politics and Regime Theory	Alternative Theory	Critical Pragmatic	Others
Analytical frames	About 'conception'	<i>Adityanandana & Gerber, 2019</i> <i>Wells & Lamb, 2022</i>	Marshall, 1998* Omar, 2004 Permanasari & Sintusingha, 2021	<i>Wade, 2019</i> <i>McNeill, 2022</i>	<i>Yassin et al., 2011</i>	Addae-Dapaah, 2005
	About 'design'		<i>Huyn, 2015</i> <i>Berawi et al., 2019</i>	<i>Prasetyo et al., 2022</i>		<i>Acero et al., 2021</i> <i>Zakaria et al., 2018</i>
	About 'implementation'			<i>Avery & Moser, 2023</i>		<i>Setiadi et al., 2021</i>
	About 'operation'	<i>Kleibert & Kippers, 2015</i>	<i>Yun et al., 2022</i>	<i>Harms, 2015</i>		<i>Gopalakrishnan et al., 2022</i> <i>Sinthalapadi Srikanth et al., 2022</i>
	About 'implications'	<i>Shatkin, 2008</i> <i>He & Tritto, 2022</i>	<i>Kleibert, 2018</i>	<i>Hawken et al, 2021</i> <i>Pratama et al., 2023</i>	<i>Rizzo, 2020</i> <i>Gao & Lim, 2023</i> <i>Paramita et al., 2023</i>	<i>Damayanti et al., 2018</i> <i>Damayanti et al., 2021</i>
	Others		<i>Shatkin, 2017</i>	<i>Bovensiepen & Meitzner-Yoder, 2018</i>	<i>Hanakata & Gasco, 2018</i>	

Note. Text in italic indicates the provenience of the main author, or the majority of the authors, is from a non-ASEAN institution. * = not specified.

Remarkably and in coherence with the previous bibliometric analyses, papers about 'conception', implications and conceptions are equally distributed among all the theoretical spectrum. Similarly, papers about operation and a number of articles with various theoretical standpoints remark on the local fragmentation of topics, interests, scholarship and, ultimately, scholar discourses which characterize the regional literature on the mixed-used. An example is given by the contemporary discourses left outside the scope of this research which oversees historical neighborhoods in the Southeast Asian cities as intrinsically mixed-use space, as per the case of some areas of Bangkok (Jhearmaneechotechai, 2022), transitioning into mixed-use creative clustering (Issarathumnoon, 2022), or the studies

which relates urban features, as walkability, to mixed land uses (Demdoum et al., 2024).

CONCLUSION

This research and its novel framework it advances introduces a novel perspective on mixed-use urban megaprojects, identifying an under looked and blurred intersection in the literature. Aimed to the comprehension of this intersection, this research brings into the discourse a different perspective in the understanding of the ontological phenomenon of mixed-use developments and urban megaprojects and the way these spatially, socio-

economically, and environmentally affect the cities at various latitudes.

Analytical tools such as the Biblioshiny app offer valuable resources for conducting research reviews and for casting light in the literature; however, the vast range of analyses possible on a single dataset poses risks of misinterpretations, biases, challenges in the selection of the items and synthesis of results. Another limitation emerged during the realization of the final framework, subject to the interpretation of the authors and subordinated to the categories that compose this experimental analytical tool.

With a selection of quanti-qualitative analyses, this study theorizes and confirms the interplay between the topic of mixed-use megaprojects and the broader concept of mixed-use on one side, while on the other side, this article remarks and defines the nesting of the mixed-use urban megaprojects as an emerging yet still overlooked subcategory of the megaprojects. While the pioneering works of Dick and Rimmer (1998), Douglass (2002), Fainstein (2001, 2008) and Olds (1995), among others, established the foundation for a critical definition of the privatized large-scale developments in the Global South, actual results show how at various latitudes there has been limited continuation of their contributions. Concurrently, proliferation of quantitative meta-analysis on engineering aspects of the megaprojects rooted in East Asia contributes to characterize the literature towards a more pragmatic direction, loaded with diverse lessons learned from the ones initiated by the aforementioned authors. The regional Southeast Asian context, on the other hand, is characterized by a major presence of local authors, in a fragmented panorama, who write mostly under the unifying label of 'development'. This claims for further paradigms of interpretations and for further quanti-qualitative readings of the mixed-use urban megaprojects. Despite some advancements, considerable progress remains necessary to establish an academically informed discourse capable of shaping awareness, scholar attention, and future policymaking.

The experimental nature of the customized framework of analysis is one of those steps; it provides partial relevant results, such as a uniform distribution of the topics in the panorama, a relatively small number of research gaps, and

several texts which treat diverse topics—labeled as 'others'—that add diversity to the scholarly approach. These aspects confirm the trend illustrated in regards to the analysis executed on the ASEAN data: a major local academic production than the one in the Global South, its fragmentation, and the lack of predominant texts framing comprehensively the intersection object of the research. The implementation of this framework would serve as a compass to orient future academic production on one hand, and their positioning on the other.

Future research could arise from the reflection here presented, and by implementation of the framework created, such as: delineating the evolution of urban megaprojects in time; exploring new intersections of diverse topics; holistic connections of diverse strands of literature; reflection on the 'imported' and 'local' literature production in the Global South, and in world regions, as conducted here; the study of power dynamic within the academic production; epistemological and policy-based elaborations of results. Furthermore, shifts in geographic focus and more awareness on city-making dynamics affected by private actors, along with the examination of alternative and emerging practices within the aforementioned interplay of topics, present promising pathways for further investigation.

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