CULTURAL AND CREATIVE POTENTIAL OF EGYPTIAN CITIES: A COMPOSITE INDEX APPROACH

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Abstract

In recent decades, global interest has grown in the role of culture and creativity in fostering regional development and economic growth. This interest is rooted in the recognition of the contributions of the creative sectors to innovation, job creation, and cultural vibrancy within urban areas. These sectors are considered drivers for culture-led development at local, regional, and national levels, thus supporting regional economies. This study aims to classify Egyptian cities based on their potential as cultural and creative cities. Using established research and international indices, the study develops a Composite Cultural and Creative Cities Potential Index (CCCPI) tailored to Egyptian cities. The methodology includes an expert-based e-questionnaire dimensions selection and weighting, the Min_Max normalization method, and weighted sum aggregation techniques. The CCCPI comprises three sub-indices—cultural vitality, creative economy, and enabling environment—encompassing ten dimensions and sixty-four indicators. Results reveal significant disparities among cities, which are categorized into five distinct groups. The findings offer policy recommendations tailored to each category and emphasize each group's strengths and weaknesses through the index's sub-indices. This research provides policymakers, urban planners, and stakeholders with a comprehensive understanding of the cultural and creative potential of Egyptian cities.

Keywords: Culture and Creativity, Cultural and Creative Cities index, Regional Development, Culture-led Development, Creative Economy

1. INTRODUCTION

The potential of creative and cultural cities in driving economic and social development has gathered increasing attention in the field of regional and urban studies. According to Rodrigues & Franco's (2017) extensive review of 102 publications, there is a growing interest in understanding how creative cities can

drive economic growth through cultural and creative activities. However, a significant gap remains in the literature concerning the performance measurement of creative cities and the role of networks in enhancing their performance (Rodrigues & Franco, 2020). This research paper assesses the unique cultural assets and creative potentials of Egyptian cities within Egyptian urban contexts, drawing on various studies that highlight the significance of creative and cultural potential as economic drivers and social enhancers. This study aims to classify Egyptian cities based on their potential as cultural and creative cities, providing a comprehensive understanding of their cultural and creative potentials as a base for enhancement of these cities' economic capacities.

1.1. The Role of Cultural and Creative Cities

Research indicates that future dynamic cities will not be those driven by real estate markets, but those that use cultural and heritage resources to create new urban values, where there is an emphasis on the importance of culture in driving sustainable urban development (Carta, 2012). Furthermore, it is evident that cities with diverse economic structures provide fertile environments for the development of creativity and innovation, as local diversity promotes cross-disciplinary knowledge spillovers, thereby supporting a more resilient and dynamic local economy (Cerisola & Panzera, 2021; Poli et al., 2023). Some researchers argue that a diversified urban economy is more likely to foster creative activities, offering broader opportunities for economic development compared to specialized regions (Desrochers & Leppälä, 2011). On the contrary, other researchers argue that creative cities thrive on the agglomeration of specialized firms and highly skilled labor, fostering innovation through dense interfirm networks and project-based work (Scott, 2006), where these cities can benefit from globalization to create a network of competitive and cooperative creative cities worldwide. Additionally, cultural and creative cities are characterized by high levels of creativity and cosmopolitanism, significantly contributing to regional economic growth, where an urban creative environment not only fosters local economic development but also has positive spillover effects on its broader region (Cerisola & Panzera, 2021).

In order to benefit from cultural and creative assets across cities, tailored policy measures should be established to support culture-led development (Van Puyenbroeck et al., 2021). These policies need to integrate all community members into the urban fabric to fully realize the creative city's potential (Scott, 2006), as contradictions within the creative city policies result in negative impacts on creative workers, professionals and the whole community (Vivant, 2013). A recent study by Poliet al (2023) concluded the importance of integrating cultural and creative strategies into business practices to enhance competitiveness and drive sustainable economic growth. Moreover, it points out that cultural diversity and multiculturalism can be leveraged to enhance creativity and innovation (Poli et al., 2023). While, others reported that there is a need for targeted public policies to ensure that creative industries reach a feasible

scale and to consider the specific economic contexts and capacities of different regions to maximize the potential benefits (Castro-Higueras & De Aguilera-Moyano, 2018). Meanwhile, Bertoni et al (2021) asserted the importance of localized cultural policies to support diverse and inclusive cultural environments (Bertoni et al., 2021).

Recent evidence suggests that cities, regardless of their size, can utilize their unique cultural heritage and vibrant local participation to attract creative tourists, thereby driving local development and economic growth. This indicates a significant opportunity for cities to enhance their creative economy through targeted strategies and improved infrastructure (Mareque et al., 2021). Also, fostering and sustaining a vibrant creative economy is possible through key elements such as localized cultural policies, grassroots initiatives, and the integration of creative practices into everyday life (Waitt & Gibson, 2009).

1.2. Review of Cultural and Creative Cities Indices

A number of studies and international organizations have proposed cultural and creative city indices that offer a holistic approach to understanding and measuring the creative and cultural potential of cities, emphasizing the importance of both tangible and intangible cultural assets in driving urban development. Moreover, it could serve as a valuable tool for policymakers and urban planners to develop strategies that enhance creativity and support economic growth.

As shown in Table 1, this research has reviewed all the established indices related to measuring the creative and cultural potential of cities and classified them into two distinct groups based on their comprehensiveness. The first group includes comprehensive indices that encompass most aspects of cultural and creative cities, includes the Creativity Index (Three T's), the European Creativity Index, the CCI Creative City Index, the Creative City Index, the 3Ci index, and the Cultural and Creative Cities Monitor. The second group comprises limited indices that focus on one or two aspects of cultural and creative cities, includes the Cultural life index, Hong Kong's Creativity Index, the Creative Community Index, the Creative, and the Creative Vitality Suite Index. These classifications help to understand the scope and focus of different indices used to measure the cultural and creative potential of cities.

1.3. Review of Cultural and Creative Cities Indices

As this research is concerned with measuring the cultural and creative potential in Egyptian cities, the first group of indices were critically analyzed in order to create a context-specific composite index that includes the most repetitive and influential dimensions for the Egyptian context. Table 2 illustrates the most common dimensions covered in the reviewed comprehensive indices and their frequency of occurrence. This review helps identify the dimensions and sub-dimensions that are repeatedly emphasized across various indices, highlighting their importance in evaluating the cultural and creative potential of cities.

TABLE 1 - CLASSIFICATION OF CULTURAL AND CREATIVITY INDICES

Group of Indices	Index	Author/Organization (date)	Main Themes
Comprehensive indices that include most aspects of cultural and creative cities	Creativity Index (Three T's)	(Florida, 2002)	Talent – Technology - Tolerance.
	European Creativity Index (ECI)	(KEA European Affairs, 2009)	Human Capital - Openness and Diversity - Cultural Environment – Technology - Institutional Environment - Creative Outputs
	CCI Creative City Index (CCI-CCI)	John Hartley, Jason Potts & and Trent MacDonald, 2012)	Creative industries scale and scope – Micro-productivity - Attractions and economy of attention - Participation and expenditure - Public support - Human capital - Global integration - Openness, tolerance and diversity
	Creative City Index (CCI)	(Landry & Hyams, 2012)	Political and public framework, Distinctiveness - diversity, vitality and expression - Openness, trust, tolerance and accessibility - Entrepreneurship, exploration and innovation - Strategic leadership, agility and vision - Talent and the learning landscape - Communication, connectivity and networking - The place and placemaking - Livability and well-being - Professionalism and effectiveness
	3Ci index	(Yum, 2020)	Creative Class - Creative Infrastructure - Culture
	Cultural and Creative Cities Monitor (CCCM)	(European Commission. Joint Research Centre., 2023)	Cultural Vibrancy (Cultural Venues & Facilities and Cultural Participation & Attractiveness) - Creative Economy (Creative & Knowledge-based Jobs, and New Jobs in Creative Sectors) - Enabling Environment (Human Capital & Education, Openness, Tolerance & Trust, Local & International Connections (transport) and Quality of Governance).
Limited indices that include one or two aspects of cultural and creative cities	Cultural life index	(Picard et al., 2003)	Limited to the cultural perspective of the cities: Cultural ecosystem (cultural supply or availability) - cultural demand or participation - the cultural activity
	Hong Kong's Creativity Index	(Hui et al., 2004)	Concerned with the competitiveness of Creative cities on a global scale: Outcomes of creativity - Structural and institutional capital - Human capital - Social Capital - Cultural Capital
	Creative Community Index	(Rawson et al., 2005)	Limited to the cultural community features: Cultural literacy - Participatory cultural practice - Professional cultural goods and services
	Creative Grid	(Fleming & Marx, 2006)	Limited to Creative industries: 10 Infrastructural Conditions for creative industries' growth and competitiveness
	Creative Vitality Suite Index	(ArtsWA - Washington State Arts Commission & WESTAF, 2016)	Limited to the creative occupational categories: Creative sectors and industries - Jobs that make up the creative sector - Wages and revenues - Non-profit arts organization revenue

Source: The authors

The first index used in the analysis is Florida's "Creativity Index" (Three T's model), which consists of three main dimensions: Talent, Technology, and Tolerance (Florida, 2002). It is considered the most primitive index in this area, which has been developed and modified over time. This model has been tested in many studies, such as Chaloupková et al., who analyzed the development of the creative economy in various regions of the Czech Republic (Chaloupková et al., 2018). The second index is the "European Creativity Index (ECI)" structured around six pillars, each including specific indicators (KEA European Affairs, 2009). Its multidimensional and holistic approach ensures an understanding of the factors that drive creativity, incorporating both cultural and non-cultural elements to accurately reflect the creative potential of different cities, regions and countries' cultures within the European Union.

TABLE 2.- REPETITIVE AND INFLUENTIAL DIMENSIONS IN COMPREHENSIVE CULTURAL AND CREATIVE CITY INDICES

Common dimensions	3 T's	European Creativity Index (ECI)	CCI-CCI	CCI (Charles Laundry)	3Ci index	CCCM	Repetitiveness frequency
Tolerance and Diversity	✓	✓	✓	✓	✓	✓	6
Creative Education	✓	✓	✓	✓	✓	✓	6
Creative Professions	✓	✓	✓		✓	✓	5
Innovation	✓		✓	✓		✓	4
Cultural Venues & Facilities		✓	✓	✓		✓	4
Governance		✓	✓	✓		✓	4
Physical Infrastructure (Connectivity)			✓	✓		✓	3
Support infrastructure (Public services)			✓	✓	✓		3
Creative Industries		✓	✓		✓		3
Cultural Attractions			✓			✓	2
Research and Development	✓		✓				2
Virtual Connectivity		✓	✓				2
Creative Expenditure (government)		✓	✓				2
Livability				✓			1
Globalization			✓				1

Source: The authors

The third index is the "Creative City Index (CCI)", which provides a comprehensive framework for evaluating the creativity of cities (John Hartley et al., 2012). This index is constructed across eight principal dimensions, each with multiple distinct elements, and it serves as a robust tool to enhance the creative and cultural environment of cities and foster economic growth and social innovation. The fourth index is the "Creative City Index (CCI)", which offers a holistic framework for assessing the creative potential and vibrancy of cities (Landry & Hyams, 2012). This index measures ten key domains, as shown in in table, that emphasize the importance of fostering a culture of creativity, strategic vision, and collaborative

environments to drive sustainable urban development. The index has been applied globally, revealing the unique strengths and areas for improvement in various cities.

The fifth index is the "3Ci index", which proposes new aspects in the creativity index that integrate creative class, creative infrastructure, and culture to measure the impact of creativity on economic development more comprehensively than previous indices. It concluded that the creative class has a variable impact on economic development across different contexts, while creative infrastructure and culture consistently play crucial roles in fostering creativity (Yum, 2020). The sixth index included in this research is the Cultural and Creative Cities Monitor (CCCM), which is a benchmarking tool developed by the European Commission's Joint Research Centre to assess and compare the cultural and creative performance of cities across Europe. The CCCM framework is based on three main subindices: Cultural Vibrancy, Creative Economy, and Enabling Environment (European Commission. Joint Research Centre., 2023). This index highlights significant intra-city differences and emphasizes the importance of localized cultural policies to enhance urban sustainability and cultural participation.

2. METHODS

The objective of this study is to quantitatively evaluate the cultural and creative potential of Egyptian cities through utilizing an expert judgment-based composite index construction. The methodology is structured in five key steps: city selection, criteria selection, data collection, criteria standardization, weighting variables, and aggregating the (CCCPI) Index.

2.1. City Selection

The selection of cities for this assessment of cultural and creative potential in Egyptian cities was based on several criteria. First, the Population Size and Administrative Importance: The cities were chosen based on their population size and administrative importance, specifically selecting the capitals of the governorates, which totaled twenty-seven cities. Second, the Cultural Infrastructure: The cities that lacked fundamental components and pillars of cultural and creative cities, such as cultural venues, museums, theatres, and cinemas, were excluded from the study. Consequently, seven cities—Fayoum, Minya, Shebin El-Koum, Banha, Suez, Kafr El-Sheikh, and Arish—were excluded. Third, the Statistical Irregularities, where Egypt's capital, Cairo, was excluded due to its exceptionally high cultural and creative potential, which significantly tilted the distribution of indicators away from a normal distribution. Therefore, the final selection included the remaining nineteen cities: Giza, Alexandria, Port Said, Ismailia, Damietta, Mansoura, Zagazig, Tanta, Damanhour, Bani Sweif, Asyut, Sohag, Aswan, Luxor, Qena, Al Kharga, Sharm El-Sheikh, Hurghada, and Matrouh.

2.2. Criteria Selection

To develop the composite index for evaluating and categorizing cultural and creative cities, the criteria selection process involved a comprehensive literature review and an expert electronic questionnaire. The components of the Cultural and Creative Cities Potential Index (CCCPI) were initially derived from an extensive review of existing cultural and creative city indices and were subsequently refined and finalized through feedback obtained from an expert questionnaire. To determine the final set of sub-indices and dimensions, the authors consulted a group of eight experts, comprising both academics and practitioners specializing in culture and local development. The final list of common dimensions extracted from the literature review, containing fifteen dimensions, was sent to the experts, who were requested to score each dimension through a Likert scale from one to five based on its importance for inclusion in the index for Egyptian cities.

Based on the experts' feedback, the CCCPI index was structured into three main sub-indices, ten dimensions, and 64 indicators, as shown in Table 3. Sub-indices were calculated for the ten dimensions for each city using Equations 1 to 10: the Cultural Venues & Facilities Index (VFI), comprising 8 indicators; the Cultural Participation & Attractiveness Index (PAI), comprising 5 indicators; the Innovation Index (II), comprising 8 indicators; the Creative Industrial & Knowledge-based Jobs Index (CJI), comprising 5 indicators; the Cultural and Creative Expenditure Index (CEI), comprising 6 indicators; the Local & International Connections Index (LCI), comprising 6 indicators; the Human Capital & Education Index (HCI), comprising 7 indicators; the Physical and Virtual Connectivity Index (PCI), comprising 5 indicators; the Support Infrastructure Index (SII), comprising 8 indicators; and the Tolerance and Diversity Index (TDI), comprising 6 indicators.

$$(\text{VFI}) = \sum_{i=1}^{8} VFW_i/n \qquad (n = 8) \quad (1) \qquad (\text{LCI}) = \sum_{i=1}^{6} LCW_i/n \qquad (n = 6) \qquad (6)$$

$$(\text{PAI}) = \sum_{i=1}^{5} PAW_i/n \qquad (n = 5) \quad (2) \qquad (\text{HCI}) = \sum_{i=1}^{7} HCW_i/n \qquad (n = 7) \qquad (7)$$

$$(\text{II}) = \sum_{i=1}^{8} IW_i/n \qquad (n = 8) \quad (3) \qquad (\text{PCI}) = \sum_{i=1}^{5} PCW_i/n \qquad (n = 5) \qquad (8)$$

$$(\text{CJI}) = \sum_{i=1}^{5} CJW_i/n \qquad (n = 5) \quad (4) \qquad (\text{SII}) = \sum_{i=1}^{8} SIW_i/n \qquad (n = 8) \qquad (9)$$

$$(\text{CEI}) = \sum_{i=1}^{6} CEW_i/n \qquad (n = 6) \quad (5) \qquad (\text{TDI}) = \sum_{i=1}^{6} TDW_i/n \qquad (n = 6) \qquad (10)$$

2.3. Data collection

Data on Human Capital, education, infrastructure, Industrial & Knowledge-based Jobs, Tolerance, and support services were gathered primarily through the Central Agency for Public Mobilization and Statistics (CAPMAS), the official statistical agency in Egypt that collects, processes, analyses, and publishes all statistical data and censuses periodically every ten years. In addition, the study used data published on the websites of the Ministry of Culture (cultural palaces, cinemas, and theatres data), the Ministry of

Tourism and Antiquities (archaeological sites, museums, and hotels data), and the Ministry of Communications and Information Technology (innovation data).

TABLE 3. DIMENSIONS, INDICATORS, AND WEIGHTS IN THE CULTURAL AND CREATIVE CITIES POTENTIAL INDEX (CCCPI)

Variable & Weights		indicators	Variable & Weights		indicators
Cultural Vibrancy (40%)	Cultural Venues & Facilities 20%	Archaeological sites (No.)	Enabling Environment (30%)	Local & International Connections 6%	Airports (No.)
		Theatre (No.)			Aircrafts Movement (No.)
		Cinemas (No.)			Passengers Movement (No.)
		Museums (No.)			Tourism BUS (No.)
		Cultural Palaces (No.)			Main Train stations (No.)
		Universities (No.)			Paved Roads (km)
		Clubs (No.)		Human Capital & Education 6%	Master holders (No.)
		Youth Centers (No.)			PhD holders (No.)
	Cultural Participation & Attractiveness 20%	Theater Spectator (No.)			Arts graduates (No.)
		Cinemas Spectator (No.)			Languages and Translation (No.)
		Cultural services beneficiaries (%)			Archaeology graduates (No.)
		Concert, trips and camps beneficiaries (%)			Computing and Information (No.)
		Students in Universities (No.)			Tourism and Hotels graduates (No.)
Creative Economy (30%)	Innovation 10%	Innovation startups CO. (No.)		Physical and Virtual Connectivity 6%	Buildings Water Connected (%)
		Accelerators/Incubators (No.)			Sanitary Sewage Connected (%)
		Co-working Spaces (No.)			Electricity Connected (%)
		Research & Innovation Centers (No.)			Natural Gas Connected (%)
		funding / Investment Entities (No.)			Internet connection (%)
		Service Providers (No.)		Support Infrastructure 6%	Shops (No)
		Innovation NGOs (No.)			Malls (No.)
		Technology transfer office TTOs / TICO (No.)			Public Buildings (No.)
	Creative Industrial & Knowledge-based Jobs 10%	Cultural Places (%)			Police Stations (No.)
		Amusement & Creation & Arts Activities (%)			Hospitals (No.)
		Specialized technical, scientific activities (%)			Ambulance Centers (No.)
		Information's, Telecommunications (%)			Mobile Clinics (No.)
		Food, residence services (%)			hotels and tourist villages (No.)
	Cultural and Creative Expenditure 10%	Cultural services (LE)		Tolerance and Diversity 6%	Universities graduate Arrivals (No.)
		Concerts and trips and camps (LE)			Foreign-born population (No.)
		Media (LE)			Share of foreign migrants in the region (%)
		Carpets and rugs (LE)			International, regional organizations and foreign embassies (No.)
		Sewing and Knitting (LE)			Establishments owned by foreigners (No.)
		Bamboo, palm products (LE)			Branch of a foreign company (No.)

Source: The authors

2.4. Criteria standardization

After selecting the variables and collecting data for each city, there was a need to standardize the data. The research used numerous datasets with varying dimensions, and each component consists of several indicators, so this step is essential because each is measured in several fields using various numerical units and scales. The raw data were normalized on a scale of 0 to 100, where 0 indicates the lowest performance in the data set, and 100 represents the highest, to enable the aggregation and comparison of various data on a common scale. This study employs a popular data standardization methodology that is comparable to the methodology used to determine the Human Development Index. The normalization was based on the minimum and maximum method, Equation (11) was used with positive variables, and Equation (12) with negative variables.

$$index_{Sw} = \frac{Sw - Smin}{Smax - Smin} \qquad (11)$$

$$index_{Sw} = 1 - \frac{Sw - Smin}{Smax - Smin} \qquad (12)$$

Where Sw is the ward's average data for an individual variable, $Smin$ and $Smax$ are the minimum and maximum values, respectively.

2.5. Weighting and Aggregation

One of the most critical stages in this research is the weighting phase, as the weights of the dimensions vary when constructing a composite index based on the context, particularly when there are a variety of variables to consider. In this research, there are three sub-indices, ten dimensions, and sixty-four indicators. The same group of experts consulted during the dimensions' selection phase was requested to allocate points to the three sub-indices and the ten underpinning dimensions through a Likert scale from one to five, where more points correspond to greater importance. As a result of this survey, the sub-indices scores were calculated from the average of the encompassed dimensions. The CCCPI Index score was calculated from the weighted average of the three sub-indices: The 'Cultural Vibrancy' sub-index (40%) is the weighted average of Cultural Venues & Facilities (20%) and Cultural Participation & Attractiveness (20%). The 'Creative Economy' sub-index (30%) is the weighted average of Innovation (10%), Creative Industrial & Knowledge-based Jobs (10%), and Cultural and Creative Expenditure (10%). The 'Enabling Environment' sub-index (30%) is the weighted average of Local & International Connections (6%), Human Capital & Education (6%), Physical and Virtual Connectivity (6%), Support Infrastructure (6%), and Tolerance and Diversity (6%). Finally, the CCCPI score values were classified according to Table 4.

TABLE 4. THE (CCCPI) CLASSIFICATIONS

CCCPI Score Range	< 0.2	0.2 - 0.4	0.4 - 0.6	0.6 - 0.8	> 0.8
Classification	Very Poor Potential	Below Average Potential	Average Potential	Above Average Potential	Excellent Potential

3. RESULTS

This section presents the findings of the study, focusing on the cultural vibrancy, creative economy, and enabling environment dimensions of Egyptian cities. Each subsection explores specific aspects of these dimensions.

3.1. Cultural Vibrancy Dimensions

The cultural vibrancy sub-index assesses the presence and quality of cultural venues and facilities, and cultural participation, and attractiveness in Egyptian cities. Figure 1 illustrates the results of the cultural vibrancy sub-index.

3.1.1 Cultural venues & facilities

The 'Cultural Venues & Facilities' analysis shows Alexandria (0.95) and Giza (0.80) with excellent cultural potential, featuring numerous theatres, cinemas, museums, cultural palaces, and historical sites. Alexandria has 109 clubs and 12 cinemas, while Giza has 23 historical sites and 18 cultural palaces. Aswan (0.62) and Luxor (0.41) also have above-average potential, benefiting from numerous cultural and historical sites, like Aswan's 21 historical sites and Luxor's 9. Mansoura (0.26), Asyut (0.22), and Hurghada (0.22) show average potential, while Tanta (0.21), Ismailia (0.15), and Damanhur (0.21) fall below average. Qena (0.11) and Matrouh (0.15) show very poor potential with minimal cultural infrastructure.

3.1.2 Cultural participation & attractiveness

In the 'Cultural Participation & Attractiveness' dimension, Giza scores 0.99, showing exceptional potential with high theatre (66.000) cinema spectators (562.000), and a large number of university students (255000). Luxor follows with 0.85, driven by substantial theatre spectators (120.000). Alexandria (0.65) and Mansoura (0.48) show above-average and average potential, respectively, with notable cinema spectators and concert participation. Unlike, Ismailia (0.29) and Zagazig (0.32) have below-average potential, while Damanhur (0.1), Matrouh (0.06), and Qena (0.18) fall into the very poor category. The results highlight the importance of educational institutions and cultural services in fostering cultural vibrancy.
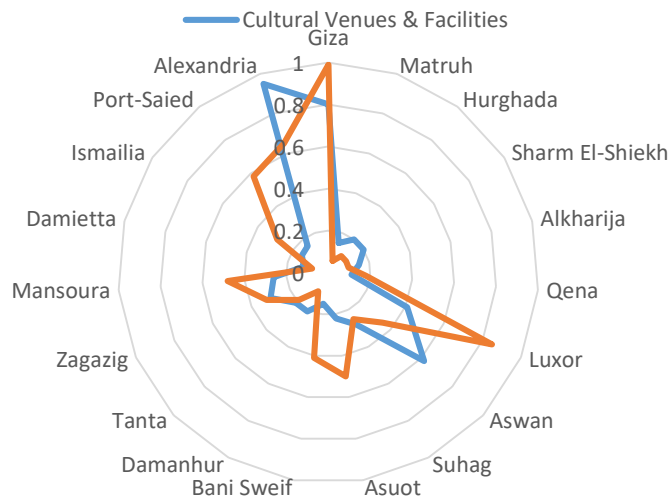
FIGURE 1 - VALUES OF DIMENSIONS OF CULTURAL VIBRANCY SUB-INDEX IN EGYPTIAN CITIES

Figure 1 compares the 'Cultural Venues & Facilities' and 'Cultural Participation & Attractiveness' dimensions across Egyptian cities. Giza and Alexandria lead in both dimensions, indicating strong cultural infrastructure and high cultural engagement. Giza's top score in 'Cultural Participation & Attractiveness' highlights its active cultural scene, while Alexandria excels in cultural venues. Conversely, cities like Qena, Damietta, and Ismailia show lower scores.

3.2. Creative Economy Dimensions

The creative economy sub-index assesses the innovation environment, creative industrial jobs, and cultural expenditure in Egyptian cities. Figure 2 illustrates the results of the creative economy sub-index.

3.2.1   Innovation

The results revealed that Giza stands out with an excellent innovation potential score of 0.94, driven by a high number of 55), co-working spaces (13), research and innovation centers (16), and funding entities (11). Alexandria has an average score of 0.48, benefiting from numerous startups (32) and co-working spaces (12) but lacks funding and research centers. Mansoura (0.13) and Asyut (0.21) show very poor potential despite having some innovation infrastructure. Other cities like Port Said (0.01), Damietta (0), and Damanhour (0.05) have minimal innovation support. Cities with diverse innovation infrastructure, like Giza, perform better in fostering creative economic activities.

3.2.2   Creative Industrial & Knowledge-based Jobs (Creative Professions)

In this dimension, Giza leads with an excellent score of 0.93, driven by its high number of cultural places (483), amusement and arts activities (238), specialized technical activities (666), and food and residence services (1101). Alexandria, Mansoura, and Zagazig show average potential benefiting from a balanced distribution of specialized technical activities and cultural places. Tanta (0.3), Asyut (0.31), and

Damanhour (0.32) have below-average potential (0.48) with moderate cultural engagement. Cities like Port Said (0.11), Damietta (0.11), and Bani Sweif (0.16) have very poor potential due to limited amusement and information services. Qena (0.15), Hurghada (0.1), and Matrouh (0.03) display minimal presence in creative industries, highlighting the need for a range of creative professions and robust cultural infrastructure.
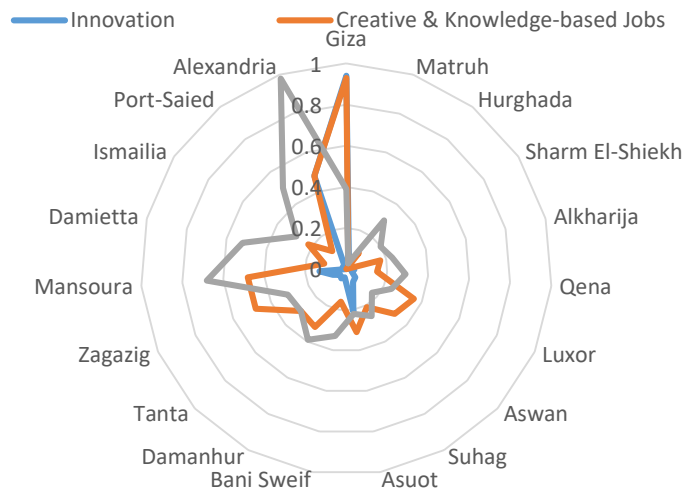

FIGURE 2 - VALUES OF DIMENSIONS OF CREATIVE ECONOMY SUB-INDEX IN EGYPTIAN CITIES

Figure 2 shows that Giza leads in 'Innovation,' 'Creative & Knowledge-based Jobs,' and 'Cultural and Creative Expenditure,' highlighting its strong innovation environment, diverse creative job market, and high cultural investments. Alexandria also performs well, especially in cultural spending. In contrast, cities like Matrouh, Bani Sweif, and Qena have lower scores in all dimensions.

3.2.3   Cultural and Creative Expenditure

Analyzing the 'Cultural and Creative Expenditure' dimension resulted that Alexandria leads with an excellent score of 0.98, driven by substantial investments in cultural services (1382 Mil LE), concerts and trips (225 Mil LE), media (164 Mil LE), and sewing and knitting (51 Mil LE). Mansoura (0.68) and Port Said (0.5) show above-average and average potential with balanced spending on cultural activities. Giza (0.39), Damanhour (0.39), and Bani Sweif (0.33) have below-average potential with moderate spending on cultural services. Suhag (0.17), Qena (0.29), and Matrouh (0.03) show very poor potential with minimal cultural expenditure. The results indicate that cities with diverse and substantial investments in cultural and creative sectors, such as Alexandria and Mansoura, score higher.

3.3. Enabling Environment Dimensions

The enabling environment dimensions assess the local and international connections, human capital, education, physical and virtual connectivity, support infrastructure, and tolerance and diversity in Egyptian cities. Figure 3 illustrates the results of the enabling environment sub-index.

3.3.1   Local and international connections

This dimension reveals that Giza (0.96) and Alexandria (0.68) lead in connectivity, driven by high aircraft and passenger movement and extensive paved roads. Sharm El-Sheikh and Hurghada (0.9) also show excellent potential due to their tourist infrastructure. Aswan (0.63) and Luxor (0.65) have above-average potential, while Mansoura (0.21) and Tanta (0.16) have below-average potential, supported by multiple airports and significant passenger traffic. Port Said (0.2) and Damietta (0.04) show very poor potential due to minimal infrastructure. This highlights that cities with comprehensive transport infrastructure and high passenger volumes, such as Giza and Sharm El-Sheikh, excel in connectivity.

3.3.2   Human capital & education

Giza (0.93) and Alexandria (0.82) lead in the 'Human Capital & Education' due to high numbers of master's holders (2678 and 1570) and PhD holders (483 and 936), along with diverse graduates in fields such as computing, information, and languages. Mansoura (0.47) and Zagazig (0.28) have average potential, supported by notable numbers of higher education graduates, though lacking diversity in specialized fields. While Tanta (0.22) and Bani Sweif (0.24) show below-average potential. Port Said (0.08) and Damietta (0.08) fall into the very poor potential category due to low graduate numbers and limited academic diversity. Results indicate cities with comprehensive and diverse educational infrastructures score higher.

3.3.3   Physical and virtual connectivity

Most of the cities in the dimension of 'Physical and Virtual Connectivity' show high potentials like Damietta (0.97), Giza (0.93), and Alexandria (0.93) lead with excellent potential due to high connectivity in water, electricity, sewage, and internet. Tanta (0.94) and Aswan (0.88) also show excellent potential, while Zagazig (0.81) and Bani Sweif (0.8) have above-average potential. Matrouh (0.74) shows average potential, and Port Said (0.85) and Mansoura (0.85) are limited by lower connectivity. Qena (0.51) demonstrates below-average potential.

3.3.4   Support infrastructure

The analysis of this dimension results in Giza (0.99) and Hurghada (0.9) lead with excellent potential, driven by high numbers of shops (4.5k and 2.1k), malls (437 and 35), and public buildings (957 and 1178), as well as substantial hospital (139 and 5) and ambulance center infrastructure (107 and 54), and

numerous hotels and tourist villages (69 and 277). Sharm El-Sheikh (0.8) also shows excellent potential due to its high number of hotels (229) and public buildings (287). Alexandria (0.73) benefits from a high number of public buildings (1356), shops (11.5k), and hospitals (104). Mansoura (0.5) and Zagazig (0.5) have average potential, while Aswan (0.61) and Luxor (0.55) are supported by significant hotel numbers. Port Said (0.15) and Ismailia (0.15) show very poor potential due to limited infrastructure.
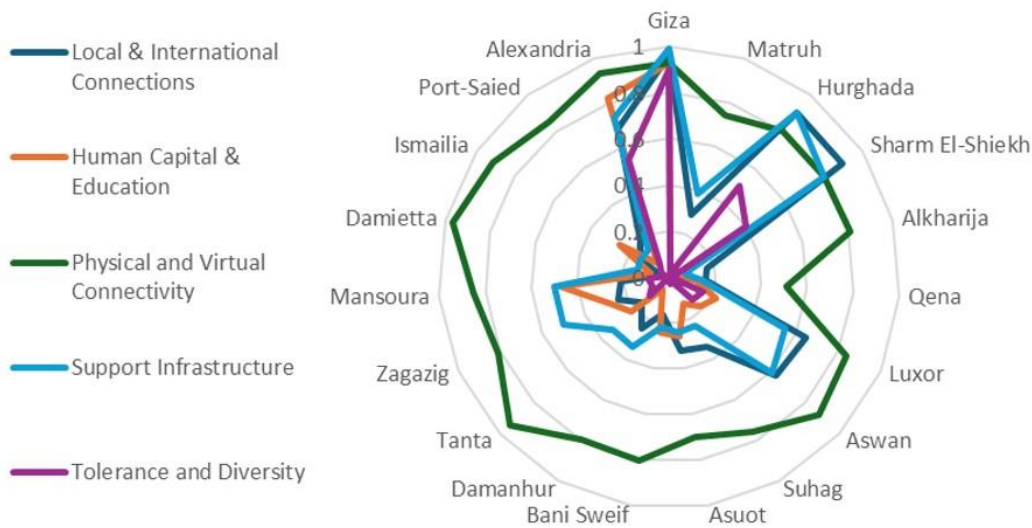

FIGURE 3 - VALUES OF DIMENSIONS OF ENABLING ENVIRONMENT SUB-INDEX IN EGYPTIAN CITIES

Figure 3 shows that Giza excels in 'Local & International Connections,' 'Human Capital & Education,' 'Physical and Virtual Connectivity,' 'Support Infrastructure,' and 'Tolerance and Diversity,' indicating strong infrastructure and connectivity. Alexandria also scores high, particularly in 'Local & International Connections' and 'Human Capital & Education.' In contrast, cities like Qena, Asyut, and Damietta have lower scores.

3.3.5   Tolerance and diversity

The 'Tolerance and Diversity' dimension demonstrates that Giza (0.9) leads due to a high foreign-born population (24,963), a substantial share of foreign migrants (0.7%), and numerous international organizations (97) and foreign-owned establishments (165). While, Hurghada (0.5) and Sharm El-Sheikh (0.4) also show excellent potential. Alexandria (0.54) has average potential with a notable foreign-born population (9,420) and many foreign-owned establishments (220), but a lower share of foreign migrants (0.2%). Mansoura (0.09) and Zagazig (0.08) show below-average potential, while Port Said (0.07), Damietta (0.02), Ismailia (0.04), and Bani Sweif (0.01) fall into the very poor category due to low foreign-born populations and limited international organizations.

3.4. *Cultural and Creative Cities Potential Index (CCCPI)*

The results of the three sub-indices are shown in Figure 4, and analyzed as follows:

3.4.1   Cultural Vibrancy Sub-index

The analysis of the 'Cultural Vibrancy' sub-index, including 'cultural venues & facilities' and 'cultural participation & attractiveness', showed that Giza (0.9) and Alexandria (0.8) demonstrate excellent potential due to their rich range of cultural venues, high numbers of theatre and cinema spectators, and large university student populations. Luxor (0.6) and Aswan (0.49) show above-average potential, benefiting from numerous historical sites and cultural palaces. Cities like Mansoura (0.37), Asyut (0.36), and Port Said (0.37) exhibit average potential, driven by moderate cultural infrastructure and participation. In the below-average category, Tanta (0.2), Ismailia (0.2), and Damanhur (0.16) struggle with fewer cultural amenities and lower participation rates. Finally, cities such as Qena (0.15), Matrouh (0.11), and Damietta (0.1) fall into the very poor potential category, with minimal cultural facilities and engagement. The data indicates that cities with substantial cultural infrastructure and rich cultural heritage tend to score higher in cultural vibrancy.

3.4.2   Creative Economy sub-index

The 'Creative Economy' sub-index, encompassing 'innovation,' 'creative industrial & knowledge-based jobs,' and 'cultural and creative expenditure,' highlights significant disparities among Egyptian cities. Giza (0.75) and Alexandria (0.65) lead with above-average potential, driven by strong innovation infrastructure in Giza (0.94) and substantial cultural expenditure in Alexandria (0.98). Mansoura (0.43) and Luxor (0.3) exhibit average potential, supported by balanced investment in creative jobs and cultural expenditure. Cities like Port Said (0.21) and Damietta (0.21) fall into the below-average category, struggling with lower innovation scores and moderate cultural expenditure. Ismailia (0.18), Tanta (0.21), and Matrouh (0.03) show very poor potential, reflecting minimal scores across innovation and cultural expenditure. It is concluded that cities, like Giza and Alexandria, with comprehensive support in all dimensions achieve higher creative economy potential, while those with limited and narrowly focused investment, like Port Said and Matrouh, struggle to enhance their creative economic activities.

3.4.3   Enabling Environment sub-index

The results obtained from the analysis of the 'Enabling Environment' sub-index, encompassing local & international connections, human capital & education, physical and virtual connectivity, support infrastructure, and tolerance and diversity, indicate that Giza (0.94) and Hurghada (0.6) demonstrate excellent potential, driven by high scores in physical and virtual connectivity, strong support infrastructure, and significant tolerance and diversity. Alexandria (0.74) also shows excellent potential, bolstered by robust physical connectivity and human capital. Mansoura (0.42) and Zagazig (0.38) exhibit average potential with balanced infrastructure and connectivity but lower human capital and education scores. Luxor (0.48) and Aswan (0.49) benefit from good local and international connections and strong physical infrastructure. Port Said (0.27), Damietta (0.25), and Ismailia (0.3) fall into the below-average potential

category due to limited infrastructure and lower scores in human capital and diversity. Qena (0.19) and Alkharija (0.21) show very poor potential, reflecting minimal international connections and low human capital. These results emphasize that those cities with comprehensive infrastructure, high connectivity, and diverse human capital, such as Giza and Alexandria, excel in enabling environments.
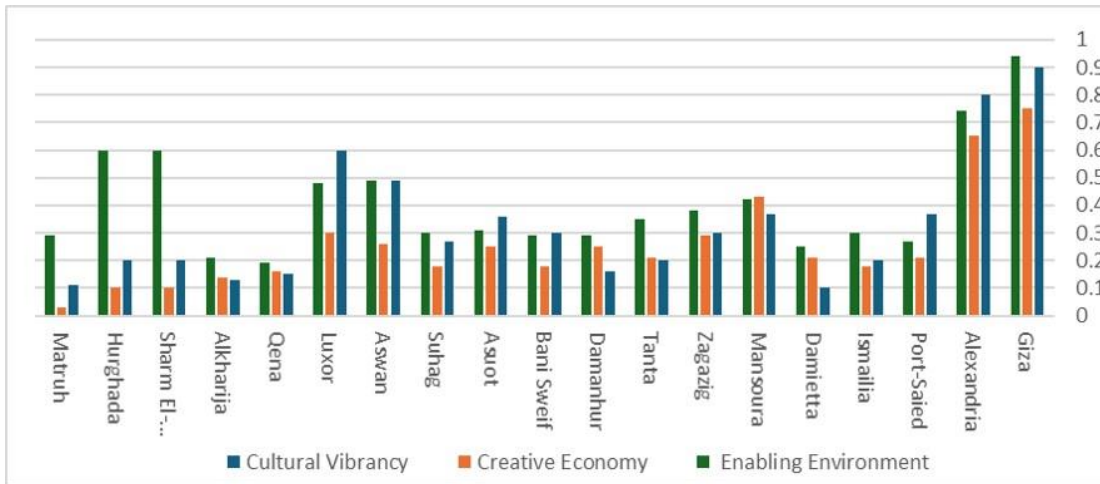

FIGURE 4 - SUB-INDICES OF THE CULTURAL AND CREATIVE CITIES POTENTIAL INDEX OF THE EGYPTIAN CITIES SUB-INDEX

Figure 4 shows Giza and Alexandria leading in 'Cultural Vibrancy,' 'Creative Economy,' and 'Enabling Environment,' indicating strong overall performance. Hurghada and Sharm El-Sheikh excel in 'Enabling Environment' but lag in other areas. Qena, Damietta, and Ismailia have low scores across all dimensions.

3.4.4 Cultural and Creative Cities Potential Index

The 'Cultural and Creative Cities Potential Index' for Egyptian cities highlights significant disparities in their ability to drive cultural-led development. Giza (0.87) and Alexandria (0.74) exhibit excellent potential, underpinned by high scores in enabling environment (0.94 and 0.74), creative economy (0.75 and 0.65), and cultural vibrancy (0.9 and 0.8). These cities benefit from comprehensive infrastructure, strong local and international connections, substantial cultural participation, and high levels of innovation and creative job opportunities. Hurghada (0.6) and Sharm El-Sheikh (0.6) show above-average potential, due to very good connectivity and infrastructure but have poor human capital and diversity. Cities like Luxor (0.49), Aswan (0.42), and Mansoura (0.4) present an average potential, as they have modest scores in all dimensions, but are lacking a key element of the innovation and human capital categories. The below-average and very poor potential cities presented in Port Said (0.29), Ismailia (0.23) and Damietta (0.18) because they score below-average and very poor potential in the sub-indices creative economy and enabling environment, yet show limited scores in cultural vibrancy. Based on these results, Figure 5 shows that the highest-potential cities are Giza, and Alexandria, as they are better positioned to lead cultural-led development, particularly since they score high on robust infrastructure and connectivity, large shares of

cultural and creative investments and strong human capital. On the other hand, the seven cities with lower potential, including Port Said and Damietta, face infrastructure and connectivity challenges, as well as low levels of cultural participation. This explains why effective policies in these areas are most needed to significantly improve their cultural and creative potential.
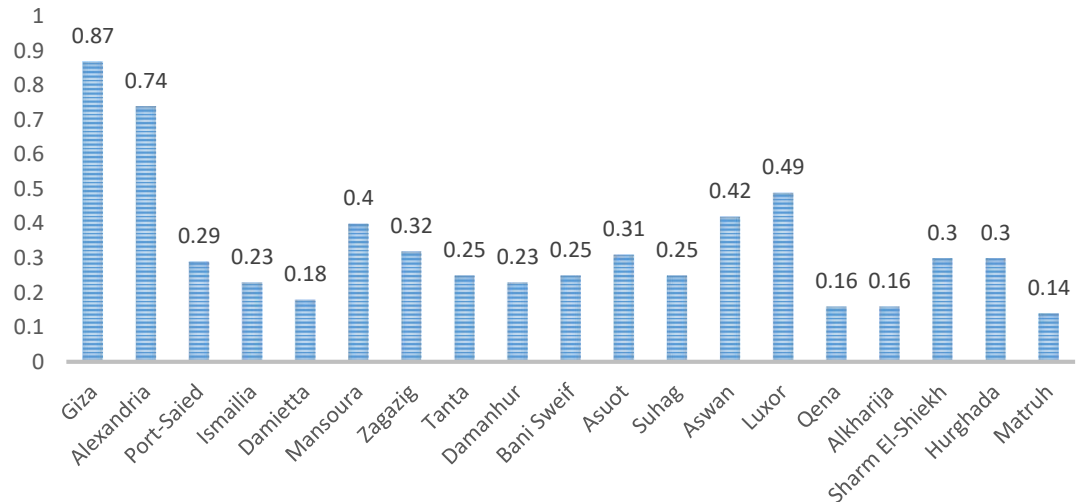

FIGURE 5 - CULTURAL AND CREATIVE CITIES POTENTIAL INDEX OF THE EGYPTIAN CITIES

Figure 5 shows the cultural and creative cities potential index (cccpi) scores for egyptian cities. giza (0.87) and alexandria (0.74) lead, indicating strong cultural and creative potential. luxor (0.49) and aswan (0.42) show moderate potential. qena (0.16), matrouh (0.14), and al kharga (0.16) have the lowest scores, highlighting the need for improvement. this figure identifies cities with the highest and lowest cultural and creative potential.

4. DISCUSSIONS

The cultural and creative characteristics of selected cities have shown their ability to influence the economic development of their regions, as the application of the 'Cultural and Creative Cities Potential Index' reveals considerable differences in the cities' capacity to drive cultural-led development. The results of this study show that Giza and Alexandria lead the CCCP index with excellent potential, due to their robust infrastructure, high levels of connectivity, significant cultural and creative investments, and strong human capital emphasize their capacity to sustain and grow their cultural and creative sectors, as cities with well-developed infrastructure and high cultural attraction tend to perform better in creative economy indices (Landry & Hyams, 2012). Despite their high scoring, these cities usually face challenges such as maintaining and expanding their infrastructure corresponding to the increasing cultural activities (Montalto et al., 2019). Targeted policies for these cities are increasing funding for cultural infrastructure,

supporting social innovation through culture-based creativity, providing creative economy incentives, fostering international collaborations, and enhancing digital connectivity.

Mansoura, Luxor, and Aswan exhibit average potential with balanced scores across various dimensions. Mansoura benefits from solid scores in cultural and creative expenditure and support infrastructure. Luxor and Aswan's strengths lie in their cultural venues and local & international connections. Though, these cities need enhancements in innovation and human capital, as reflected in their lower scores in these areas. Policies regarding educational programs and innovation hubs could significantly boost their cultural and creative potential (Pratt, 2008), in addition to infrastructure development, public-private partnerships, and local creative industries promotion. Although, Hurghada and Sharm El-Sheikh show below-average potential, despite their high scores in local & international connections, physical and virtual connectivity, and strong support infrastructure, which reflect their well-developed tourism sectors, yet, these cities lack cultural venues and need to improve their human capital and diversity. Proposed policies for these cities are integrating tourism and cultural initiatives, promoting cultural diversity, establishing creative skill development centers, organizing cultural festivals, and supporting local talents (Cerisola & Panzera, 2021).

Cities like Port Said, Ismailia, and Damietta fall into the below-average and very poor potential categories and struggle with limited infrastructure, lower connectivity, and minimal cultural and creative engagement. Addressing these deficiencies through targeted basic infrastructure development, human capital enhancement programs (Evans, 2009; Scott, 2006) community engagement initiatives, and raising awareness about culture as a resource for creativity and innovation (KEA European Affairs, 2009).

5. CONCLUSIONS

The aim of the present research was to classify the cultural and creative potential of Egyptian cities, and accordingly, the study has generated the 'Cultural and Creative Cities Potential Index' (CCCPI), a composite index specific to the Egyptian context. This index provides a clear investigation of the potential of Egyptian cities, aiming to enhance the understanding of their cultural and creative capacities and to support their economic growth. The results reveal that high-potential cities like Giza and Alexandria are well-positioned to lead in cultural and creative development due to their robust infrastructure, diverse creative industries, and significant cultural investments. These cities demonstrate strong performance across all dimensions, including cultural vibrancy, creative economy, and enabling environment. Conversely, cities with lower potential, such as Qena, Matrouh, and Al Kharga, require targeted policies and investments to enhance their cultural and creative sectors. The study highlights the importance of implementing policies and creating a supportive environment for cultural and creative activities to achieve

sustainable development. Based on the CCCPI, national and local authorities should adopt tailored policies that address deficiencies in the cities' sub-indices to foster cultural and creative growth. A limitation of this study is the availability of data for certain indicators, which led to their exclusion from the initial list of indicators. Future research should focus on the empirical assessment of creative city performance, considering the importance of networks and cultural clusters in fostering sustainable urban development. This work emphasizes the need for a holistic approach to studying creative cities, integrating economic, social, and cultural dimensions to better understand and promote urban creativity and innovation.

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