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TOWARDS A SMART & COMPACT CITY: CHALLENGES AND OPPORTUNITIES FOR TIRANA, ALBANIA

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Abstract

Urbanization has become one of the defining dynamics of the 21st century, generating growing pressures on mobility, housing, environmental quality, and governance. Smart City and Compact City models have emerged as complementary paradigms for addressing these challenges: the former through technological innovation and data-driven governance, and the latter through spatial efficiency, high density, and sustainable mobility. This study investigates how the capital of Albania, Tirana, can integrate these approaches into a comprehensive Smart–Compact–Resilient framework grounded in citizen participation and climate adaptation. Using a mixed-methods design, the research combines quantitative and qualitative analyses based on a structured survey of 350 residents across Tirana's central, suburban, and newly developed areas. The questionnaire examined four dimensions urban, social, environmental, and health through six sections that assessed mobility, housing, participation, technology, and resilience. The study proposes an integrated model for a Smart, Compact, and Resilient Tirana, combining digital innovation, inclusive governance, and climate resilience.

Keywords

Smart & Compact City, Tirana, Urbanization, Sustainability, Resilience.

Introduction

Urbanization is one of the defining processes of the twenty-first century, with more than half of the global population currently living in urban areas a figure projected to reach nearly 70% by 2050 (United Nations, 2020). This transition has created complex challenges for cities worldwide, including traffic congestion, air pollution, housing shortages, waste management, and pressure on infrastructure and natural resources. Addressing these issues requires new approaches that integrate technological, spatial, and social dimensions of urban development. The Smart City concept has emerged as a strategy for enhancing efficiency and innovation through digital technologies, big data, and ICT-based governance (Caragliu& Nijkamp, 2011; Mathew et al., 2024). In parallel, the Compact City model emphasizes high-density development, mixed land use, and sustainable transport to curb urban sprawl and reduce environmental impacts (OECD, 2012; Kain et al., 2020). Yet, the implementation of these paradigms has often faced structural limitations. In Central and Eastern Europe, the main barriers involve bureaucratic fragmentation, lack of coordination, and insufficient technical expertise (Janurová et al., 2020).

A growing body of literature criticizes the technocentric bias of Smart City policies, arguing that they prioritize efficiency and economic growth over inclusivity and environmental justice (Lee, 2017; Simonofski et al., 2019). Lee (2017)

proposes integrating the Smart City and Sustainable City paradigms into a single framework, where technology functions to enhance citizen well-being rather than as an end in itself.

Recent international frameworks mark a paradigm shift toward people-centred urbanism. The UN-Habitat People-Centred Smart City Guidelines (2025) emphasize that technology should be a tool for equity, sustainability, and human rights rather than a goal itself. The four guiding principles of shared prosperity, resilience, community participation, and inclusiveness are central to the new generation of smart initiatives (UN-Habitat, 2025; Oikawa et al., 2023). Similarly, the OECD (2012) and UNDP–ARUP–TalTech (2024) frameworks advocate integrating digital innovation with spatial planning, social justice, and climate resilience as interdependent pillars of sustainable development.

In the Albanian context, Afezolli (2022) emphasizes that the country's rapid urbanization and increasing car dependency have led to significant environmental and social pressures, particularly in Tirana. She argues that adopting smart growth strategies such as compact spatial planning, improved public transit, and green infrastructure can mitigate the negative effects of uncontrolled urban expansion and automobile dependence in Albanian cities (Afezolli, 2022). Tirana, the capital of Albania, provides a revealing case within this evolving debate. Over the past three decades, the city has experienced rapid demographic, economic, and spatial transformations driven by internal migration and market liberalization. Despite notable progress including municipal digitalization, the expansion of cycling lanes, and urban greening projects, major challenges remain, such as traffic congestion, air pollution, rising housing costs, and limited citizen participation (Municipality of Tirana, 2021). Survey results from this study confirm these concerns: 88% of citizens identify traffic as their main daily problem, 74% point to air pollution, and 65% to high living costs. At the same time, strong public support for smart transport (69%), green infrastructure (68%), and compact urban growth (83%) illustrates a widespread readiness for transformative policies. National research has shown similar climate-related transformations, where increasing temperatures and declining precipitation have altered land use and urban dynamics (Gjoni &Kucaj, 2025). Building on these insights, this study examines how the principles of Smart and Compact Cities integrated within a people-centred and resilience-oriented framework can serve as a roadmap for Tirana's transition toward a sustainable, inclusive, and climate-adaptive future. By linking citizen perceptions with urban policy and international best practices, it aims to contribute to the global debate on how post-socialist and Global South cities can avoid technocentric pitfalls and align with the UN's 2030 Agenda for Sustainable Development.

Methodology

Research Design and Case Study Selection: Tirana, Albania

This study adopts a mixed-methods approach, combining quantitative and qualitative analyses to explore citizens' perceptions and challenges in Tirana's transition toward a Smart and Compact City. This aligns with global recommendations emphasizing that integrating statistical and participatory methods enhances urban policy design **(**OECD, 2012; ARUP, 2024**).**

Tirana was selected as the case study due to its rapid urbanization and transformation in demographics, infrastructure, and mobility **(**Afezolli, 2022**).** Key challenges-transport congestion, air pollution, housing affordability, and climate

risks—shaped the study's six analytical sections. Following UN-Habitat's (2025) *People-Centred Smart City Guidelines*, citizens were placed at the core of the analysis, focusing on participation, equity, and resilience.

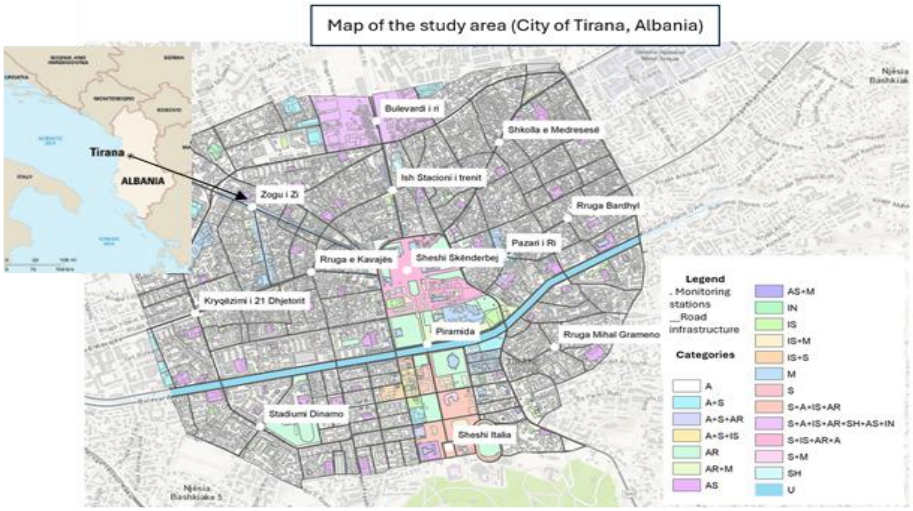

Figure 1. Map of the study area, Tirana, Albania (Source: Adapted from Annual Report "Air Quality and Noise Pollution ", Co-PLAN 2024. Designed by the authors using ArcGIS, 2025)

The structured questionnaire was built on four dimensions from Smart–Compact City literature urban, social, environmental, and health and seven thematic sections covering quality of life, digital governance, urban compactness, inclusion, and future visions for Tirana. Its structure drew from international models such as the Composite Citizen Framework **(**Mendybayev et al., 2022**)** and the People-Centric Smart City Model **(**Oikawa et al., 2023**)** to ensure methodological consistency with global practices.

Data Collection

The survey combined closed- and open-ended questions to merge statistical analysis with qualitative insights. A pilot test (15–20 participants) ensured clarity and validity. The target population included Tirana residents aged 18+, with a sample of 350 respondents selected through stratified random sampling across three urban zones (city centre, suburbs, new developments). The survey was distributed both online (238 responses) and in person (112 interviews).

Data Analysis

The study used both quantitative and qualitative methods to comprehensively understand citizens' perceptions and experiences. Quantitative analysis applied descriptive statistics (frequencies, means, standard deviations) and comparative tests by gender, age, and residential area, identifying key urban challenges in transport, air quality, public services, and housing (Sections 4.1–4.3).

Qualitative analysis examined open-ended responses through thematic coding, revealing issues such as mobility, greenery, waste management, digital access, and social inclusion (Sections 4.4–4.6).

Finally, the findings were compared with international research on Smart, Compact, and Resilient Cities to contextualize Tirana's development within global best practices. This mixed-method approach ensured both statistical accuracy and

interpretive insight, forming a strong basis for citizen-centred urban policies and the advancement of Tirana's Smart & Compact City vision.

Figure 2 summarizes the study's methodological structure, outlining a sequential process: selecting Tirana as the case study, collecting data via a structured questionnaire, conducting quantitative and qualitative analyses, and integrating results with international Smart, Compact, and Resilient City experiences.

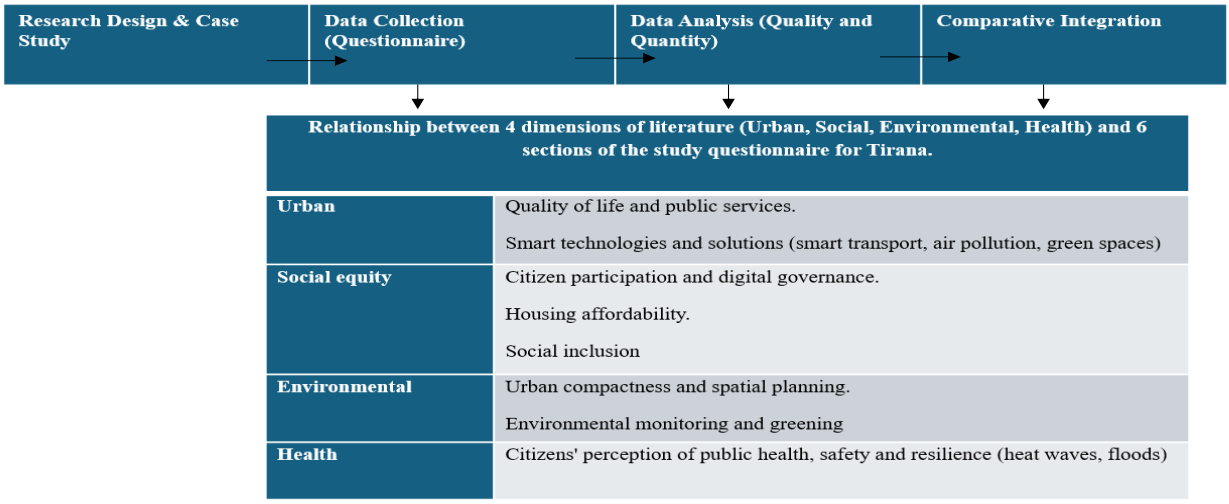

Figure 2. Methodological Framework for the Smart & Compact City Study, Source: Authors' elaboration, adapted from Composite Citizen Framework (Mendybayev et al., 2022), People-Centric Smart City Model (Machida et al., 2023), and European Smart Cities Information System (SCIS, 2017).

The figure also illustrates the connection between the four analytical dimensions Urban, Social, Environmental, and Health and the six thematic questionnaire sections, covering quality of life, public services, digital governance, spatial compactness, environmental monitoring, and urban resilience.

This framework highlights how the mixed-methods design ensured coherence between theory and empirical evidence, linking global Smart–Compact City concepts with Tirana's specific socio-urban context.

Results and Discussion

From the 350 respondents in Tirana (66% women, 34% men), the results show several important trends which are divided into 6 main sections.

The survey findings reveal a complex picture of Tirana's urban transition, where technological innovation, spatial efficiency, and citizen participation coexist with deep challenges of inequality, limited transparency, and environmental stress. The discussion interprets these results within six main analytical dimensions -urban, social, environmental, and health while situating Tirana in the broader context of Smart and Compact City practices in Europe and beyond.

General Information about Civic participation

Section 1 indicates that the survey sample is representative of educated, long-term residents, particularly women and working-age adults, who can provide valuable insights for shaping Smart & Compact City policies in Tirana.

The demographic profile of respondents reflects a socially active, well-educated, and economically engaged segment of Tirana's population. The majority are young to middle-aged adults (25–44 years old, 67%), with a clear predominance of female respondents (65%). Education levels are strikingly high, with over 90% holding university or postgraduate degrees, which suggests that survey results are shaped by citizens with greater awareness of urban development issues. Employment data show that most participants are employed (70%), meaning their views are closely tied to daily experiences of transport, housing, and public services. Regarding place of residence, half live in the city centre, while the remainder are distributed across suburbs and newly developed areas, offering a mix of perspectives shaped by location-specific challenges. Furthermore, nearly three-quarters have lived in Tirana for more than a decade, demonstrating that many respondents have long-term familiarity with the city's urban transformation.

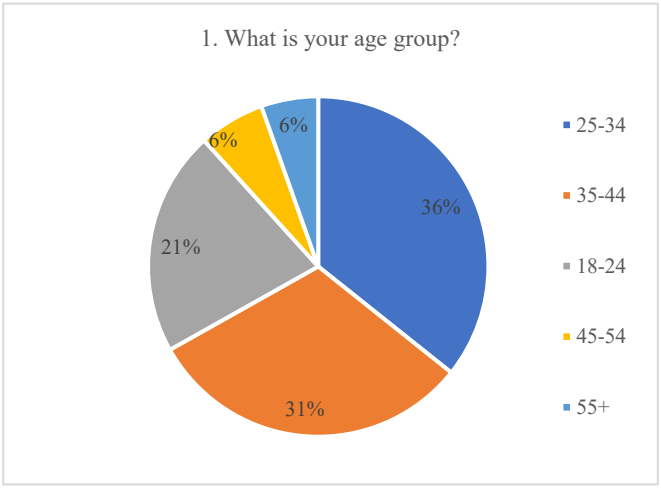

Figure 1. What is your group age?

The largest share of respondents belongs to the 25–34 age group (35.7%), followed closely by those aged 35–44 (31.1%).Younger respondents, 18–24 years old, represent 21.4%, while older age groups (45–54 and 55+) together account for only about 11.8%.This indicates that the survey mainly reflects the perspectives of young and middle-aged citizens who are actively engaged in the labour market and urban life (Figure 1).

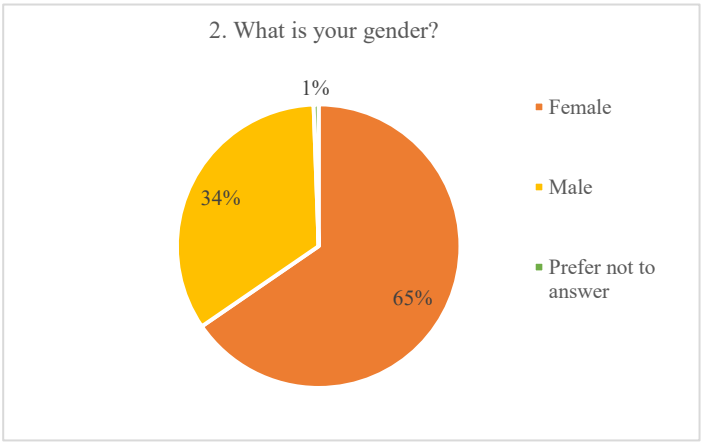

Figure 2. What is your gender?

Females represent the majority (65.6%), while males make up 34% of the respondents. Only 0.4% preferred not to disclose their gender. This shows that women were more engaged in the survey, reflecting a stronger interest in issues such as urban quality of life, environment, and social well-being (Figure 2).

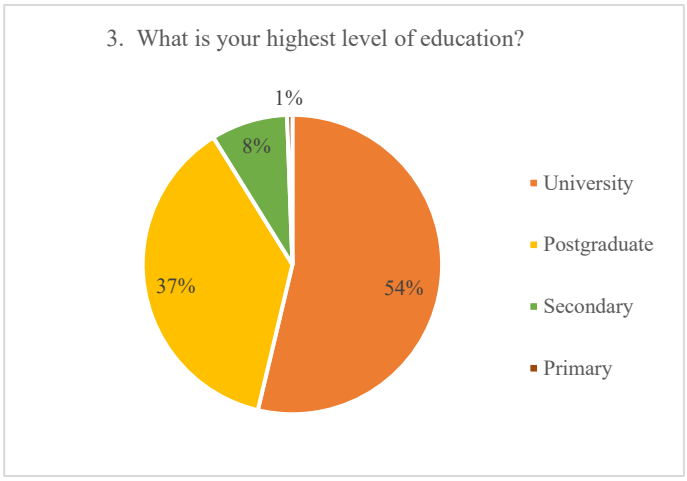

Figure 3. What is your highest level of education?

A highly educated sample: 53.8% hold a university degree and 37.4% hold a postgraduate qualification. Only 8.4% completed secondary education, and 0.4% only primary education. Over 90% of the respondents have higher education, suggesting that the survey represents citizens with strong awareness and interest in urban development and governance issues, (Figure 3).

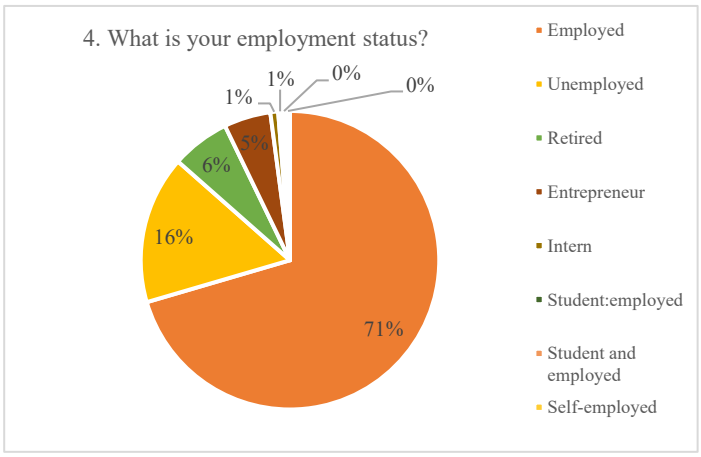

Figure 4. What is your employment status?

The majority are employed (70.2%), while 16% are students and 6.3% unemployed. Also, 5% are retired, and smaller groups include entrepreneurs, interns, or self-employed individuals. The dominance of employed respondents highlights perspectives from economically active citizens who directly experience urban challenges such as transport, housing, and services (Figure 4).

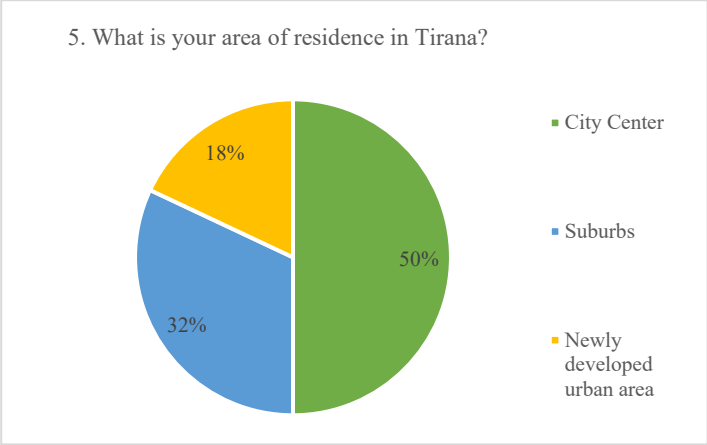

Figure 5. What is your area of residence in Tirana?

In Tirana, 50% live in the city centre, 32% in the suburbs, and 18% in newly developed urban areas. This distribution reflects a mix of urban experiences: central residents are more exposed to congestion and pollution, suburban residents face access and service challenges, and new urban area residents are experiencing rapid urbanization (Figure 5).

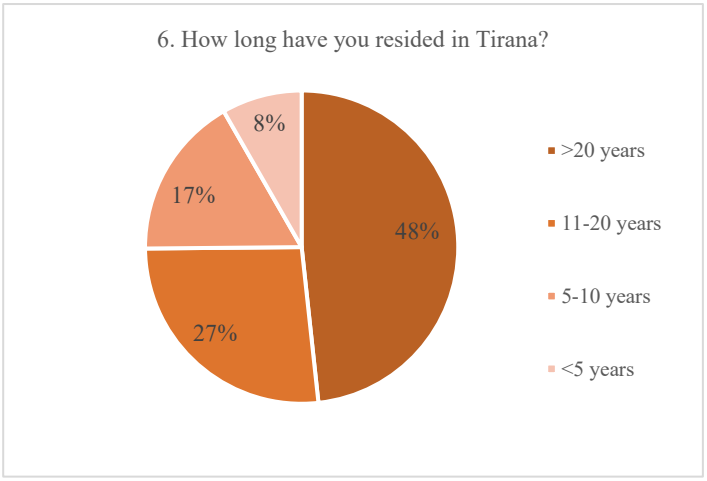

Figure 6. How long have you resided in Tirana?

The majority are long-term residents, which strengthens the reliability of their perceptions about changes, improvements, and challenges in the city. The largest segment, 48.3% have lived in Tirana for over 20 years, and 26.5% between 11–20 years, 16.8% have resided for 5–10 years, while only 8.4% are recent residents (<5 years) (Figure 6).

Urban Dimension (Mobility, Services, and Urban Liveability)

This section underscores the urgent need for improvements in transport, waste management, and air quality, along with better promotion and trust-building for digital municipal services. These findings demonstrate that citizens expect a more efficient, sustainable, and responsive urban system as a foundation for Tirana's Smart & Compact City vision. The survey

results reveal a critical perception of Tirana's urban conditions. Nearly half of respondents rate the quality of life as average, while a substantial share considers it low or very low, with only a minimal percentage perceiving it as high.

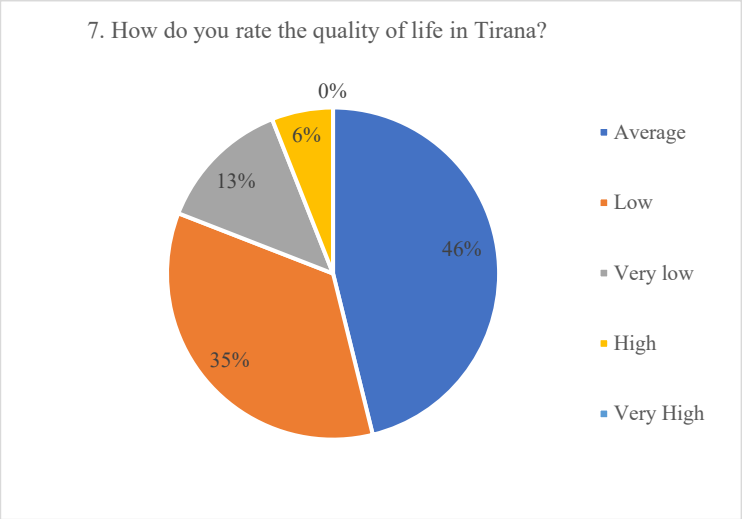

Figure 7. How do you rate the quality of life in Tirana?

Almost half of the respondents (46.2%) rated the quality of life as average. A significant portion (34.9%) rated it as low, and 13% as very low. Only 5.9% considered it high, while none rated it as very high. This indicates that citizens have a predominantly critical view of living conditions, with very few perceiving high standards of quality of life (Figure 7).

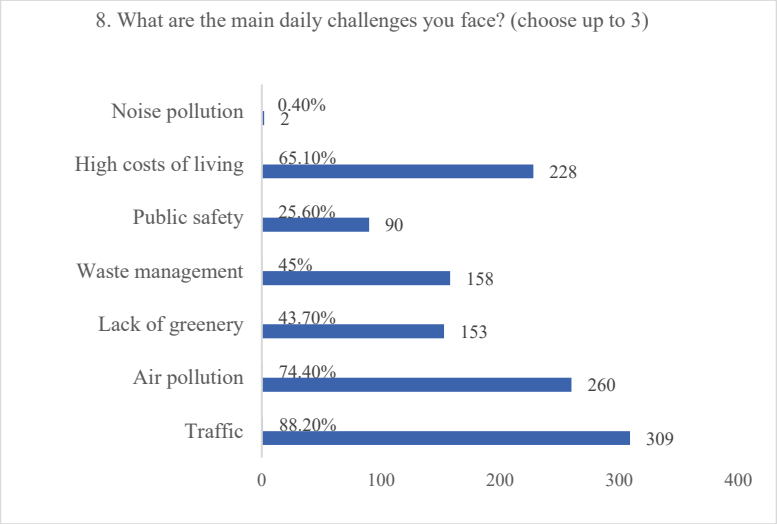

Figure 8. What are the main daily challenges you face? (choose up to 3)

Among the most pressing issues, traffic (88.2%) is by far the most common problem. Also, air pollution (74.4%) and the high cost of living (65.1%). Other significant challenges include waste management (45%) and lack of greenery (43.7%). This shows that mobility, environment, and affordability are the most serious urban problems shaping daily life in Tirana (Figure 8).

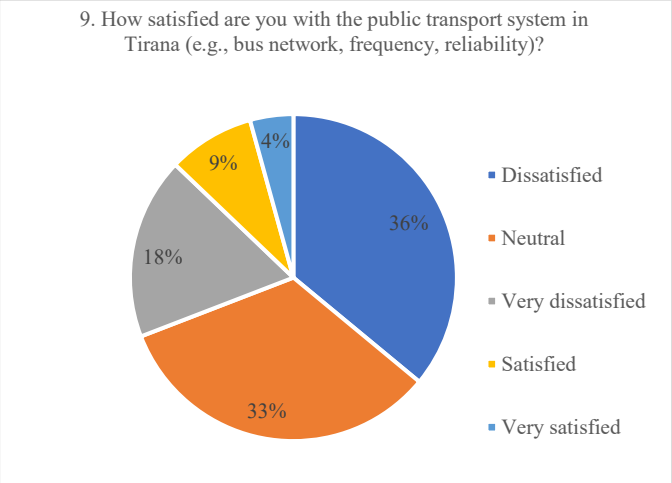

Figure 9. How satisfied are you with the public transport system in Tirana?

Regarding the satisfaction with the service of public transport, the majority are dissatisfied (36.1%) or very dissatisfied (18%), while only 12.7% are satisfied/very satisfied; 33.2% are neutral (Figure 9).

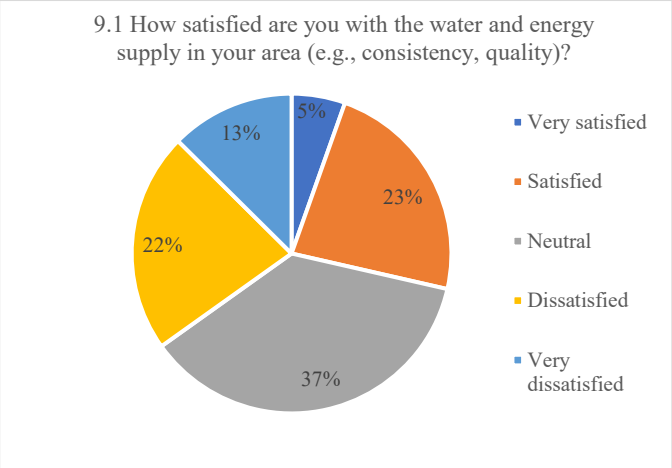

Figure 9.1 How satisfied are you with the water and energy supply in your area (e.g., consistency, quality)?

Regarding the water and energy supply sector, views are mixed. The highest portion, 36.6%, were neutral, but dissatisfaction is relatively high (22.3% dissatisfied, 12.6% very dissatisfied), compared with only 28.5% satisfied/very satisfied (Figure 9.1).

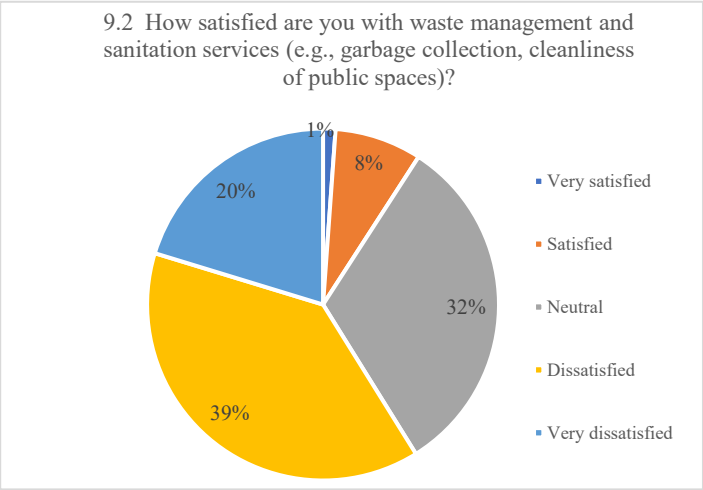

Figure 9.2 How satisfied are you with waste management and sanitation services?

The most negative ratings are for the waste management: 59% dissatisfied/very dissatisfied, only 9.2% satisfied/very satisfied, with 31.9% neutral (Figure 9.2). Waste management emerges as the least satisfactory public service, followed by public transport, while water and energy services receive more balanced but still critical views.

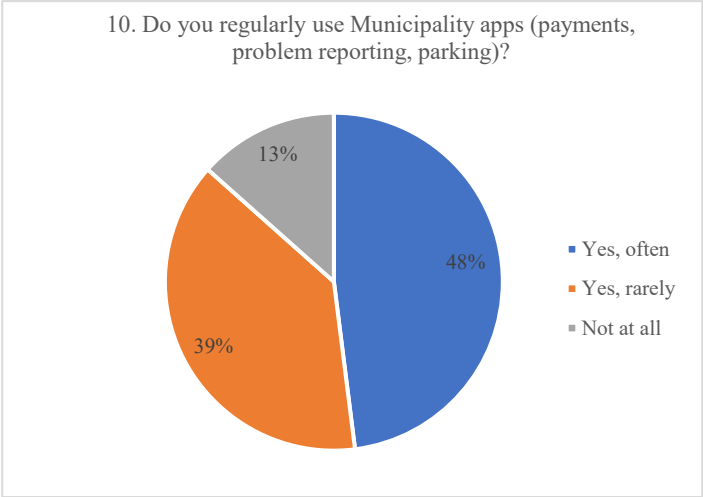

Figure 10. Do you regularly use Municipality Apps (payments, problem reporting, parking)?

Use of Municipality Apps is widespread, with 13.4% not using them at all, 38.7% using them rarely, and only 47.9% using them often. This shows a little slightly high uptake of digital municipal services, which limits the potential of e-governance and smart city tools (Figure 10).

The predominant concerns of traffic (88%), air pollution (74%), and the high cost of living (65%) underscore the intensity of urban pressures in Tirana. These challenges mirror those documented in other post-socialist cities, where rapid motorization and insufficient public transport infrastructure have worsened air quality and congestion (OECD, 2012). The citizens' dissatisfaction with public transport (54% dissatisfied or very dissatisfied) and waste management (59% dissatisfied) confirm that infrastructure and service provision remain the weakest pillars of Tirana's Smart & Compact transition. However, the relatively high use of municipal apps (48% often use) indicates growing digital readiness and

openness to smart urban tools. The challenge, however, lies in converting this digital potential into tangible improvements in mobility, waste reduction, and service quality.

The predominance of traffic congestion and air pollution in Tirana mirrors findings by Afezolli (2022), who highlights that Albania's shift toward car dependent urbanism has intensified both environmental degradation and urban sprawl. Her recommendations for integrated public transport and compact redevelopment remain critical for achieving sustainable urban growth.

Social Equity (Citizen participation and affordability)

This section reveals serious challenges in social equity and citizen participation. While citizens strongly demand technological improvements in healthcare, transport, and education, they feel largely excluded from urban planning and report very low levels of trust in municipal transparency. Housing affordability stands out as a critical pressure point, with an overwhelming majority viewing costs as unaffordable.

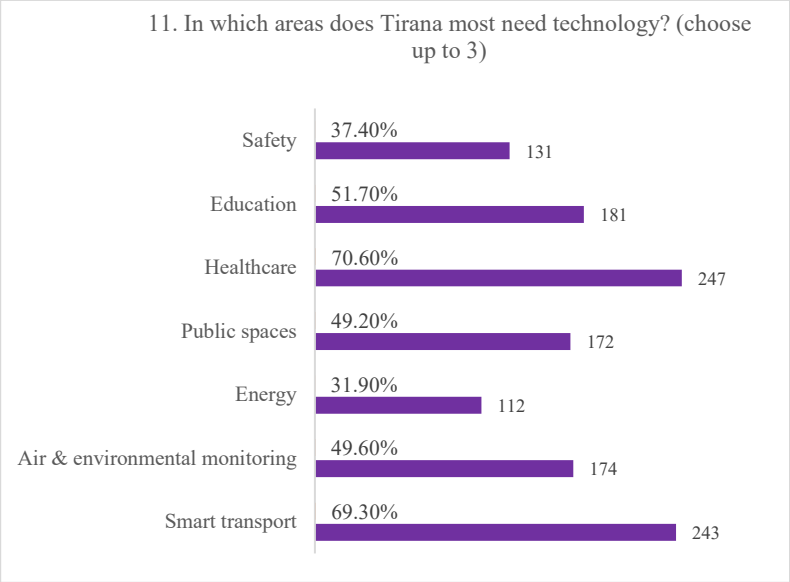

Figure 11. In which areas do Tirana most need technology? (choose up to 3)

Respondents highlighted several priority areas where citizen participation is crucial. Healthcare (70.6%) and smart transport (69.3%) were the most frequently mentioned. Education (51.7%), Air and environmental monitoring (49.6%), and public spaces (49.2%) also stand out as significant. Safety (37.4%) and energy (31.9%) were considered less urgent but still important (Figure 11). This shows that citizens perceive participation as vital in essential services (health, transport, education) and in areas tied to environmental quality and public space management.

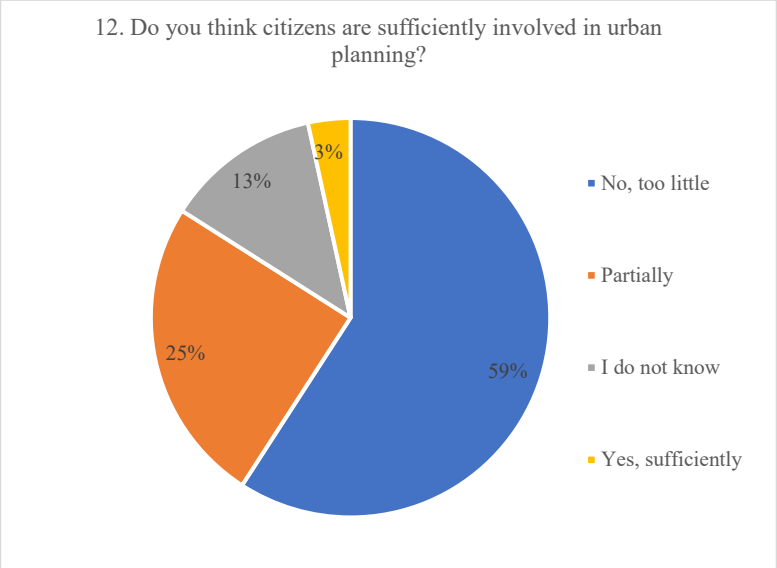

Figure 12. Do you think citizens are sufficiently involved in urban planning?

Regarding perception of citizen involvement in urban planning, about 59.2% believe that citizens are insufficiently involved, while 24.8% think their involvement is only partial. Another 12.6% are unsure, while only 3.4% feel citizens are sufficiently included (Figure 12). This demonstrates a strong perception of exclusion from decision-making processes.

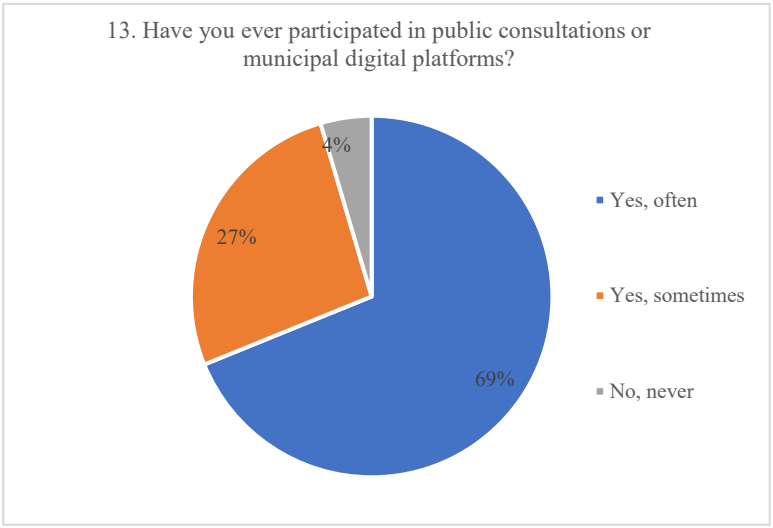

Figure 13. Have you ever participated in public consultations or municipal digital platforms?

When asked about participation in public consultations or digital platforms, about 68.9% of respondents said they use them often, 26.5% use them sometimes, and only 4.6% have never participated (Figure 13).

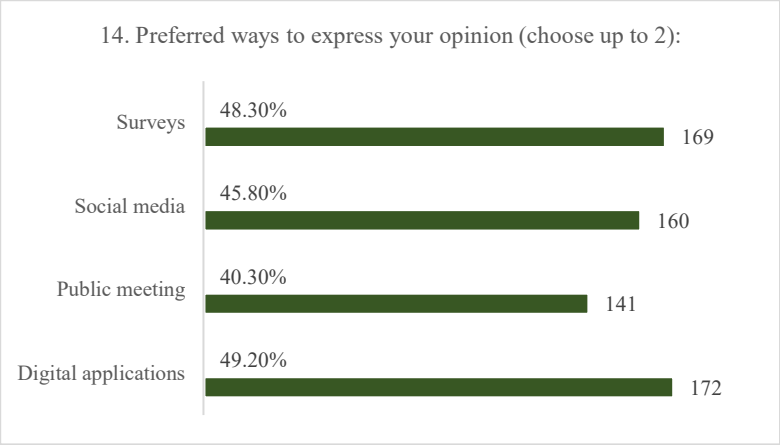

Figure 14. Preferred ways to express your opinion (choose up to 2)

Citizens favour a range of engagement methods, such as digital applications (49.2%) and surveys (48.3%) being the most popular. Social media (45.8%) and public meetings (40.3%) also play significant roles (Figure 14). There is a clear preference for modern, digital, and accessible channels, although traditional meetings remain valued.

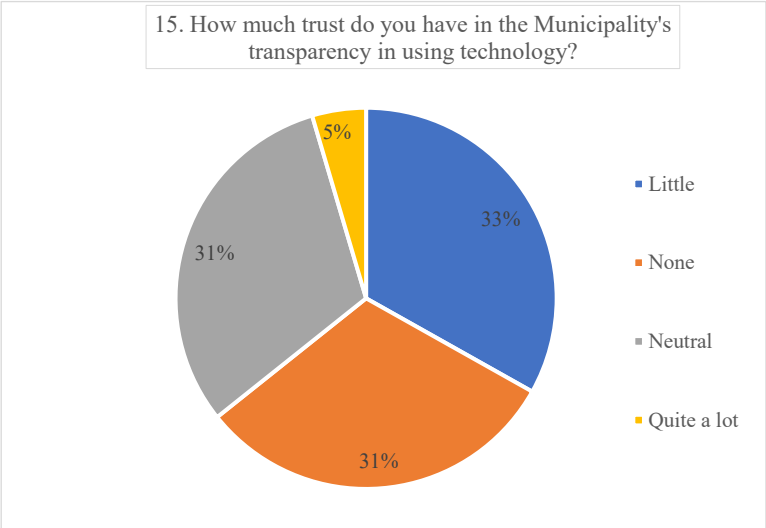

Figure 15. How much trust do you have in the municipality's transparency in using technology?

When asked about trust in the municipality's transparency when using technology, 64.3% reported that they have no trust, 31.1% are neutral, and 4.6% express higher levels of trust (Figure 15). These numbers highlight low confidence in transparency, which undermines citizen engagement.

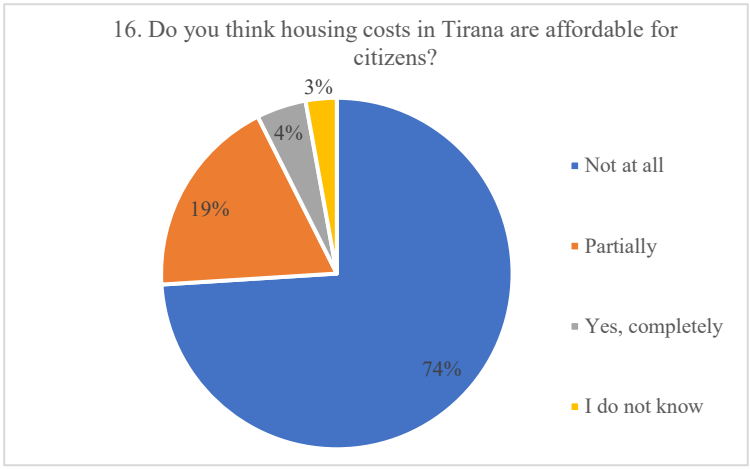

Figure 16. Do you think housing costs in Tirana are affordable for citizens?

A striking 74% state that housing is not affordable at all, and 18.5% believe it is partially affordable. Only 4.6% see it as fully affordable, with 2.9% unsure (Figure 16). Housing affordability emerges as a major social challenge in Tirana.

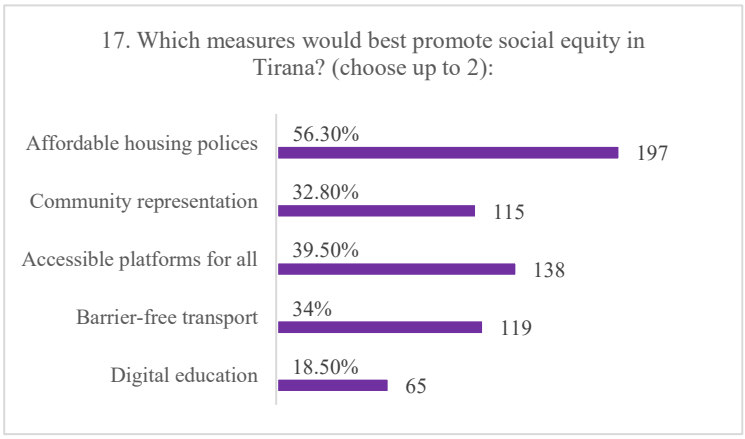

Figure 17. Which measures would best promote social equity in Tirana? (choose up to 2)

Citizens place the greatest emphasis on affordable housing as the most urgent social equity measure in Tirana, reflecting widespread concerns about rising living costs and urban affordability. Affordable housing policies (56.3%) were chosen most frequently, showing that housing affordability is considered the top priority for promoting social equity. Accessible platforms for all (39.5%) also scored highly, highlighting the need for inclusive digital and physical access to services. Barrier-free transport (34%) and community representation (32.8%) were also significant, pointing to the importance of mobility and inclusive decision-making. Digital education (18.5%) was selected less often but still seen as relevant for long-term equity (Figure 17).

These results illustrate a gap between citizen readiness for engagement and the lack of institutional channels to support it, a dynamic also emphasized by UN-Habitat's People-Centred Smart City Guidelines (2025). Housing affordability represents another major challenge with 74% considering housing costs unaffordable. To prevent similar outcomes, Tirana's Smart–Compact policy must incorporate inclusive housing strategies, following OECD recommendations (2012) for balancing density with affordability and accessibility. Overall, the results indicate that citizen participation and social

equity are the weakest pillars of Tirana's Smart & Compact City framework. Despite citizens' openness to digital tools (70% willing to use apps), institutional transparency and trust remain low. Building inclusive governance and ensuring affordable housing must therefore become central to Tirana's Smart & Compact strategy.

Environmental Dimension (Compactness, Green Infrastructure, and Climate Risks)

This section shows that Tirana's citizens are generally supportive of compact city principles, especially when linked to better transport, access to services, and environmental improvements. However, their concerns highlight the risks of overcrowding, unaffordable housing, and infrastructure pressures, along with the potential loss of cultural heritage and exposure to noise.

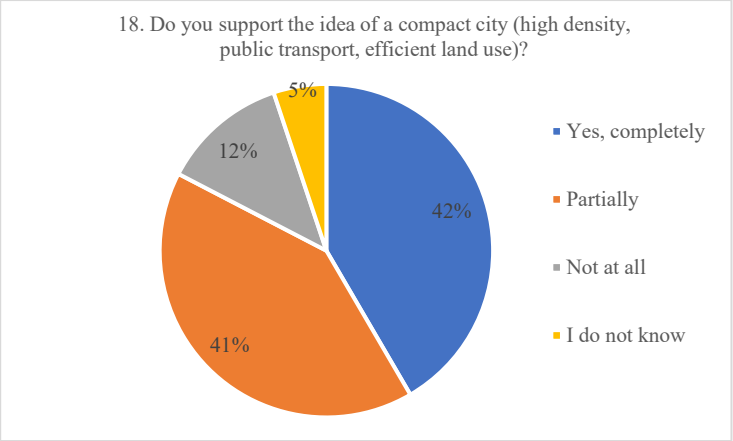

Figure 18. Do you support the idea of a compact city (high density, public transport, efficient land use)?

A strong majority of respondent's express support for the compact city model, with 41.6% fully supporting it, and 41.2% partially supporting it. Only 12.2% reject the idea, and 5% are uncertain (Figure 18). This indicates a broad acceptance of the compact city approach, suggesting citizens recognize the potential benefits of density, efficient land use, and improved public transport.

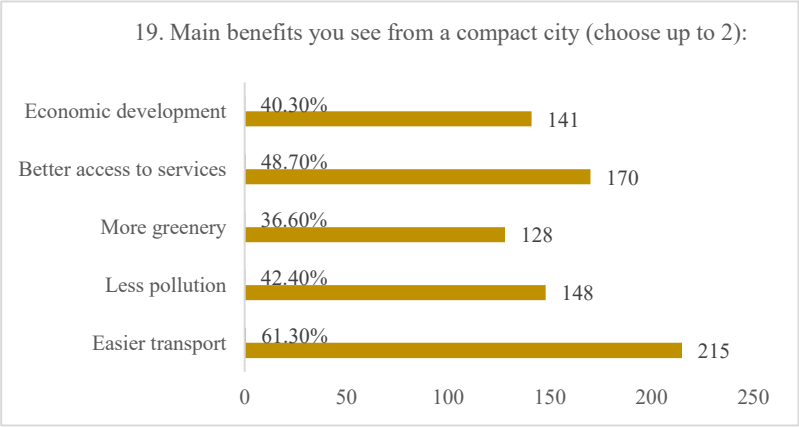

Figure 19. Main benefits you see from a compact city (choose up to 2):

Respondents identified multiple advantages of compact urban development, such as easier transport (61.3%), which is seen as the most significant benefit. Better access to services (48.7%) also ranks highly. Less pollution (42.4%) and economic development (40.3%) are also considered important. More greenery (36.6%) is highlighted by a substantial minority (Figure 19). Citizens associate compact urban form with improved mobility, service accessibility, environmental benefits, and economic opportunities.

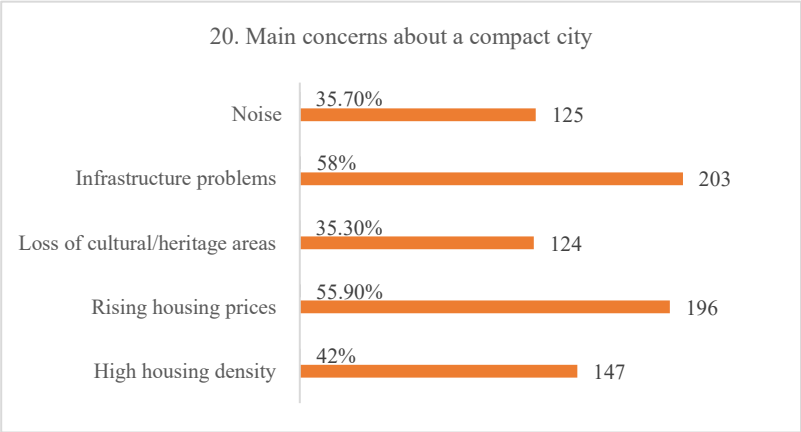

Figure 20. Main concerns about a compact city

Main concerns about a compact city range from infrastructure problems (58%) and rising housing prices (55.9%), which stand out as the most pressing concerns. High housing density (42%) is also a significant worry. Loss of cultural/heritage areas (35.3%) and noise (35.7%) are additional issues (Figure 20). Strong support for the compact city model (83%) shows public recognition of its benefits for transport and services, though concerns persist about infrastructure overload (58%), housing costs (56%), and heritage loss (35%). Priorities such as cleaner air (61%) and more green spaces (69%) highlight demand for nature-based solutions (NbS) and ecological resilience. Unlike Vienna or Amsterdam, Tirana still lacks integrated systems for air monitoring and climate adaptation. These results align with findings on climate vulnerability (Kucaj et al., 2024) and OECD (2012) guidance on compact, green growth. Building green corridors, low-carbon transport, and community monitoring is key to a Smart–Compact–Resilient Tirana.

Health and Resilience (Environmental Awareness and Urban Safety)

A vast majority of respondents acknowledge the harmful effects of air pollution, with 60.9% saying “very much” and 26.9% “quite a lot”. Only a small minority think air pollution affects their health only slightly (6.7%) or not at all (0.4%) (Table 1). This indicates a high level of public awareness and concern regarding the direct health risks of air pollution in Tirana.

	21. Do you think air pollution affects your health		22. How prepared do you think the city is to face floods, heat waves, or other climate crises	
	No. questionary	%	No. questionary	%
Very much	213	60.92	9	2.52
Quite a lot	94	26.89	19	5.46
A little	24	6.72	104	29.83
Neutral	18	5.04	59	16.81
Not at all	1	0.42	159	45.38

Table 1. Results of the answers for question no 21 and 22.

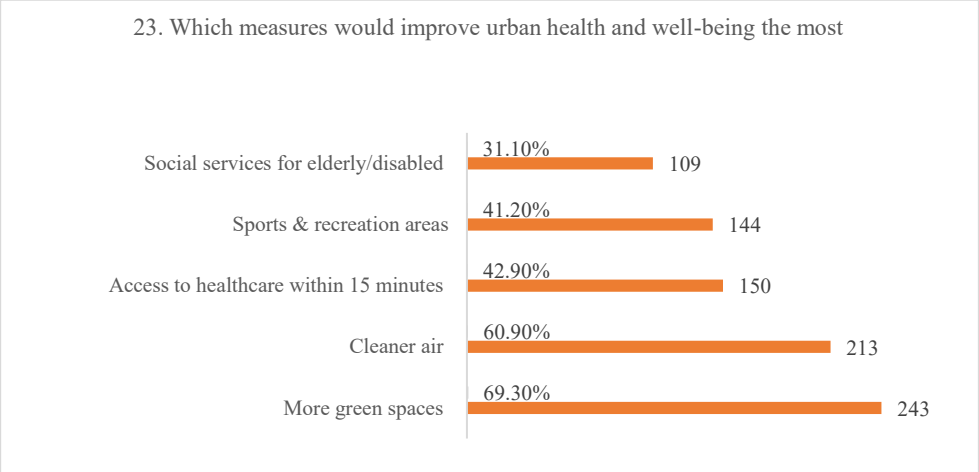

Figure 23. Which measures would improve urban health and well-being the most

Respondents prioritized more green spaces (69.3%) and cleaner air (60.9%), followed by healthcare access within 15 minutes (42.9%), sports and recreation areas (41.2%), and social services for the elderly and disabled (31.1%) (Figure 23).

These choices show a strong demand for environmental quality and accessible health and social services to enhance resilience and well-being. A large majority (87%) view air pollution as harmful to health, while 75% believe Tirana is unprepared for floods or heatwaves—indicating weak climate resilience. Citizens' emphasis on nearby healthcare (43%) and recreation spaces (41%) reflects the "15-minute city" model promoted by ARUP (2024). Integrating health, mobility, and environmental quality within this framework could strengthen urban sustainability.

Previous studies show that extreme heat and temperature variations directly affect public health and urban liveability (Kucaj & Gjoni, 2020). Strengthening early-warning systems, green corridors, and health-monitoring technologies would better align Tirana's resilience strategies with European and global frameworks. Overall, the findings confirm that public health and climate resilience are interdependent within Tirana's Smart & Compact City vision.

Citizens' Perspectives

This section emphasizes that there is a prevailing perception that the city is unprepared for climate risks, highlighting the need for stronger resilience strategies.

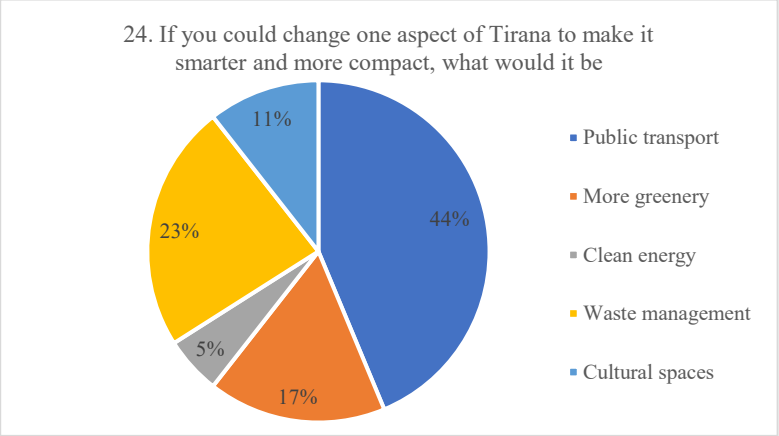

Figure 24. If you could change one aspect of Tirana to make it smarter and more compact, what would it be?

The most frequently mentioned priority is public transport (43.7%), showing citizens' strong demand for more efficient, reliable, and accessible mobility solutions. Waste management (23.5%) and more greenery (16.8%) are also important areas where citizens want improvements. Cultural spaces (10.7%) and clean energy (5.3%) received less emphasis but still reflect concerns about cultural vitality and sustainable energy use (Figure 24). Overall, citizens see mobility, waste management, and green infrastructure as the main levers for transforming Tirana into a smarter and more compact city.

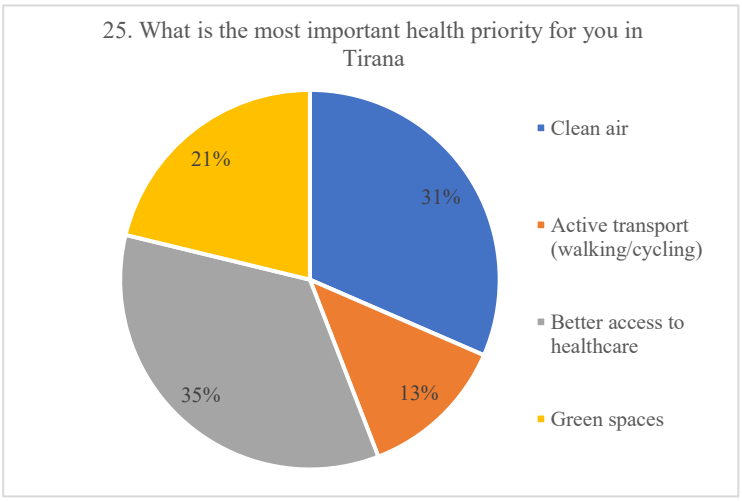

Figure 25. What is the most important health priority for you in Tirana?

The most important health priority in Tirana is considered to be better access to healthcare (34.5%). Clean air (31.5%) also ranks very high, reflecting environmental health concerns. Green spaces (21%) and active transport (12.6%) are also valued for promoting healthier lifestyles (Figure 25). Citizens emphasize both healthcare accessibility and environmental quality as essential pillars of public health in the city.

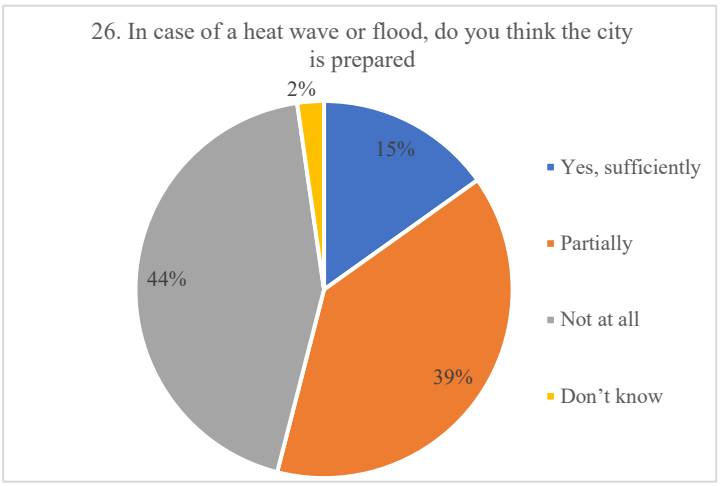

Figure 26. In case of a heat wave or flood, do you think the city is prepared?

Most respondents believe Tirana is either unprepared (43.7%) or only partially prepared (38.9%) for heatwaves and floods, while only 15.1% consider the city sufficiently ready (Figure 26). This reflects widespread concern about urban resilience and Tirana's capacity to respond to climate-related crises. The prioritization of public transport (43.7%) highlights both dissatisfaction with current inefficiencies and a collective aspiration for a cleaner, more sustainable city. Waste management (23.5%) and greenery (16.8%) also rank high, emphasizing citizens' awareness that environmental quality is essential for liveability, consistent with OECD (2012) Compact City principles promoting ecological balance and resource efficiency (Matsumoto et al., 2019). In the health domain, access to healthcare (34.5%) and clean air (31.5%) are top concerns, showing the perceived link between environmental and health issues, as underscored by UN-Habitat's (2025) People-Centred Smart City Guidelines. Similar trends appear in post-socialist cities, where rapid urbanization has strained both healthcare and environmental systems (Janurová, 2020). The low perception of climate preparedness (over 80%) reveals a gap between environmental awareness and the lack of visible resilience measures.

Addressing this requires policies aligned with national adaptation priorities for drought management and agricultural resilience (Kucaj et al., 2024; Gjoni et al., 2024). Implementing nature-based solutions, strengthening early-warning systems, and improving healthcare access would not only meet citizens' expectations but also align Tirana with international best practices for sustainable, people-centred urban governance (Kim et al., 2015; ARUP, 2024).

Conclusion and Recommendation

This study examined how Tirana can integrate Smart City and Compact City principles within a people-centred framework addressing key urban, social, and environmental challenges. Using a mixed-method approach with 350 respondents, it identified traffic congestion, air pollution, and high living costs as the most pressing issues. Although citizens show strong interest in technological solutions, particularly smart transport, waste management, and digital public services, overall satisfaction remains low. Improving the efficiency and accessibility of these systems is crucial for advancing Tirana's smart and compact transition.

From a social perspective, the research reveals limited civic participation and low trust in governance. While most residents are digitally literate, few engage in decision-making, suggesting that technology alone cannot guarantee inclusivity. Strengthening participatory governance and social equity, especially in housing, is vital to ensure that compact development does not deepen inequality.

Environmentally, citizens are highly aware of pollution and climate risks but view Tirana as unprepared for heatwaves and floods. Expanding green spaces, improving air quality, and increasing urban resilience must be central goals for sustainable development.

As overpopulation continues to grow, a city needs to achieve a balanced combination of liveability, vitality, and prosperity, thereby fostering sustainable development.

Compact city measures can enhance land efficiency, public transport use, and neighbourhood vitality, provided they are adapted to local conditions. However, success depends on citizen understanding and participation. Reaching consensus with residents through transparent communication and community dialogue should be a policy priority.

Another important direction involves the adaptive reuse of vacant buildings and disused public facilities. While some may be unsuitable for habitation, they can be repurposed for disaster prevention, climate resilience, or community-based uses. Such actions align with compact city principles and contribute to sustainable urban regeneration.

Overall, Tirana's transition toward a Smart, Compact, and Resilient city requires balancing technology with inclusion, transparency, and environmental care. Collaboration among public institutions, citizens, and the private sector is essential to create a liveable and equitable city. Future research and policy experimentation drawing also from international examples, such as Japan, can further guide Tirana toward a sustainable, adaptive, and people-oriented urban future.

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