

Almost Forgotten: Javanese City Centre Concept -- Case Study in Ponorogo, Indonesia

T Taufiqurrahman
University of Darussalam Gontor
taufiqurrahman@unida.gontor.ac.id

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Keywords	City centre, aloon-aloon, green space, Java
City Population	959,500
City Area	1,371.78 km ²
City GDP	1.4 billion USD (Ponorogo Regency)
Climate Zone	Af (tropical rainforest climate)
ARC3.3 Linkage	Urban Planning, Design, and Architecture Element

Introduction. Ponorogo is a regency (Kabupaten) in East Java, Indonesia. It is known as the birthplace of a historical legend and traditional dance, Reog Ponorogo. This regency is located in the western part of East Java and directly adjacent to Central Java. Astronomically, Ponorogo Regency is located between 111° 07' and 111° 52' east longitude and between 07° 49' and 08° 20' south latitude (Ponorogo, 2021). The anniversary of Ponorogo Regency is commemorated every August 11, as on Sunday Pon, 1 Besar 1418 Saka coincides with 11 August 1496 CE or 1 Dzulhijjah 901 AH, Bathara Katong, the first Muslim leader graduated/crowned as the first Regent (Royal Historical Society, 1951).

Economically, Ponorogo's economy is diverse, with agriculture, manufacturing, and services sectors playing significant roles. The region is known for its agricultural products, including rice, tobacco, and various cash crops. Additionally, Ponorogo has seen growth in industries such as textiles, handicrafts, and tourism, leveraging its cultural heritage to attract visitors.

Brief History and Context. The location of Ponorogo city centre at that time was in the former site of the old kingdom (Wengker) and lasted until the 1830s CE in around coordinate (-7.8537619, 111.4965399). Unfortunately, along with the defeat of Prince Diponegoro in the Java war against the Dutch, the Ponorogo regency was also badly damaged by the Dutch attack and was forced to move the city centre in order to facilitate Dutch supervision. So, the city centre of Ponorogo began to move to its current loca-

The evolution of Ponorogo's city centre reflects a narrative of resilience and adaptation, transitioning from its original site in the former kingdom of Wengker to its current location, and surviving as the city centre to the present day.



Figure 1. The city centre of Ponorogo (1496 - 1830s) is around coordinate (-7.8537619, 111.4965399) (Google, 2019)



Figure 2. The city centre of Ponorogo (1850s – present day) is around coordinate (-7.8713342, 111.4615631) (Google, 2019)

The Ponorogo city centre concept, deeply rooted in Islamic urban planning principles, embodies a holistic approach to urban development encompassing five fundamental elements: Environment, Social, Economy, Governance, and Education (ESEGE). At its core lies the *aloon-aloon*, or city square, serving as a nexus for communal interaction, cultural expression, and environmental harmony. This city centre concept consists of the central government (government building/leader's house), business centre (bazaar/market), the centre of worship and education (Masjid and Madrasa), and green open space (city square/*aloon-aloon*) (Taufiqurrahman, 2018). This concept does not only exist in Ponorogo but also in almost all regencies/cities in Java. However, the progressive erosion of traditional values and the encroachment of modernization pose existential threats to this venerable concept. This concept is becoming forgotten, and the functions of its key elements are changing as the new generation moves further away from their origin/native identity and the philosophy of their ancestors.

The *aloon-aloon* symbolizes more than a mere public space; it embodies the convergence of the microcosm (the real world) and the macrocosm (the universe), serving as a conduit for societal currents and communal cohesion. It functions as a place for ritual or religious celebration, as well as a place to demonstrate military prowess and is an instrument of power in exercising the sacred control of the ruler. Apart from being a city landmark, the city square also functions as a public space, social space, and cultural space, absorbing water and providing shade from the heat. For farm implements, depending on the household occupation. These practices can be considered early examples of running a home-based office. Embracing home-based offices in contemporary settings can contribute to reducing commuting requirements, which can also minimize vehicular emissions.

Yet, contemporary pressures have led to the commodification of the *aloon-aloon*, with paved surfaces replacing verdant landscapes (green open space) and market stalls supplanting communal gathering spaces. In recent years, urbanization and infrastructure development have transformed the landscape of Ponorogo, with efforts being made to balance modernization with the preservation of cultural and environmental heritage. Initiatives aimed at sustainable urban development, heritage conservation, and community engagement are increasingly prioritized to ensure the long-term well-being and resilience of the region. Reclaiming the essence of the *aloon-aloon* demands a renaissance of traditional wisdom, coupled with adaptive strategies to harmonize modern urbanization with cultural heritage preservation. Revitalizing the Javanese city centre concept necessitates a multifaceted approach encompassing conservation, community engagement, and sustainable urban planning. Embracing the intrinsic values of ESEGE, coupled with proactive measures to mitigate urbanization pressures and climate change impacts, is imperative to safeguarding the legacy of Ponorogo cultural heritage for future generations.

Aloon-aloon comes from the word *aloon* (a Javanese word that means wave), the wave that rocks human life in the oceans of society. This wave is moved by the wind (represented by the *waringin* tree) from all directions that grow around *aloon-aloon*. This wind is like various streams

that influence humans, for example, ideology, religion, knowledge, and beliefs. Meanwhile, the *waringin* in the middle of the *aloon-aloon*, illustrates the unity between the microcosm and the macrocosms (Khairuddin, 1995).

This Javanese-style city centre concept combines the concept of Islamic urban planning, which since the 12th - 13th centuries has been developed by considering the combination of five basic elements, namely Environment-Social-Economy-Governance-Education (ESEGE). The Javanese city centre concept that focuses/points on the *aloon-aloon* (city square/green open space) is one of the old concepts which, if implemented properly, can solve various problems faced by modern urban communities today. However, once again, this concept is slowly being forgotten and considered out of date. Problems and failures in the development process are mostly caused by the desire to form a new identity that is considered modern, without knowing/understanding the priority of existing traditional values (local wisdom).

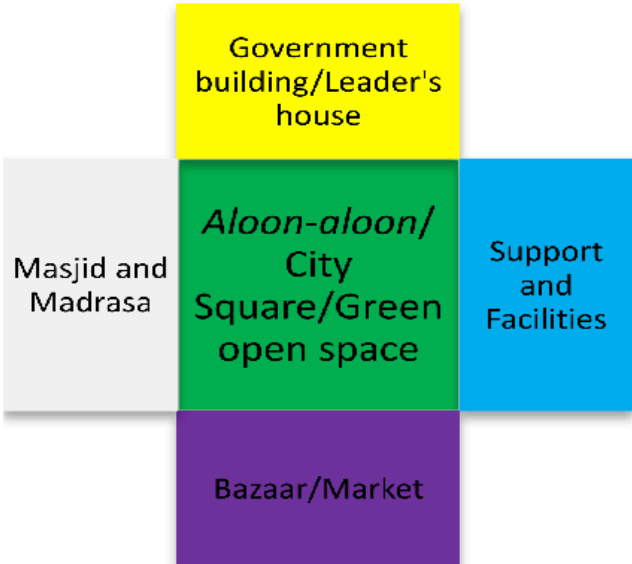


Figure 3. *The Javanese city centre basic element type 1 (the government building in the north side).*

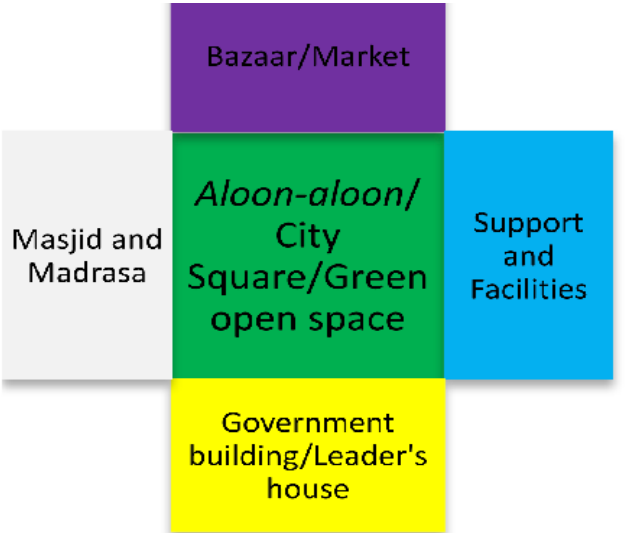


Figure 4. *The Javanese city centre basic element type 2 (the government building in the south side).*

This ancient concept with a combination of these five elements can be explained as follows:

- **Masjid and Madrasa/School.** The masjid is a representation of worship to remind us that humans are the creatures of God's creation on earth so they do not have the right to inflict damage on the environment
- **Government building/Leader's house** is leadership that ensures the implementation of education and law taught, ensuring that humans act according to the rules so that they are in harmony with nature.
- **The bazaar or Market** symbolizes the economy and people's welfare, one of the basic elements/main concerns in community development.
- **Support and Facilities**, which help the government or communities to carry out order and law enforcement, as well as various events such as welcoming guests, performing arts, celebrations, ceremonies, and so on. The support element consists of the army headquarters and police centre, prison, guest reception section, transport department, equipment warehouse, art gallery, theatre, cinema, etc.
- **Aloon-aloon (City square/Green open space)** is a symbol of the earth, a place where the leader/government, people, and all inhabitants of the earth meet or interact. This concept actually determines the function and presence of aloon-aloon in almost every old city in Java. The original concept of aloon-aloon should not be paved, but today, many have changed this area to be paved and it is no longer able to absorb water, shade from the heat, or act as a representation of the earth's fertility. Additionally, many have changed this green open space area to become a market because the bazaar area is not large enough or has been displaced by office buildings.

How does the aloon-aloon increase the city's climate resilience?

The aloon-aloon (city square) in Ponorogo plays a significant role in increasing the city's climate resilience through several mechanisms. First, aloon-aloon incorporates green infrastructure elements such as trees, shrubs, and grassy areas. These green spaces act as natural buffers against climate impacts by absorbing excess rainfall, reducing surface runoff, and mitigating the risk of flooding during heavy precipitation events. The vegetation also helps to regulate temperatures by providing shade and evaporative cooling, thereby reducing the urban heat island effect and enhancing thermal comfort in the surrounding area.

Second, aloon-aloon serves as an important component of the city's stormwater management system. The permeable surfaces in the square allow rainwater to infiltrate into the ground, replenishing groundwater reserves and reducing the burden on municipal drainage systems. By retaining and slowly releasing stormwater, the aloon-aloon helps to minimize the risk of flash floods, erosion, and waterlogged streets, thereby increasing the city's resilience to extreme weather events.

Third – in times of flooding, aloon-aloon functions as a temporary water storage area, helping to alleviate pressure on downstream areas and reduce the severity of flood impacts. The

open design of the square allows floodwaters to spread out and dissipate, preventing concentrated inundation and property damage. Additionally, the presence of green vegetation enhances the square's capacity to absorb and retain floodwaters, further reducing the risk of damage to infrastructure and buildings.

Fourth, aloon-aloon serves as a central gathering place for the community, providing a venue for social interaction, cultural events, and emergency response activities during climate-related disasters. The square's accessibility and public nature facilitate communication, coordination, and mutual support among residents, enabling collective resilience-building efforts and fostering community cohesion in the face of climate challenges.

Fifth, the greenery in aloon-aloon supports diverse plant and animal species, contributing to local biodiversity conservation efforts. A rich variety of vegetation provides habitat and food sources for wildlife, including birds, insects, and small mammals, promoting ecological resilience and ecosystem health in the urban environment. Biodiversity also enhances the square's overall resilience by increasing ecosystem stability and adaptability to environmental changes. Overall, the aloon-aloon in Ponorogo enhances the city's climate resilience by integrating green infrastructure, stormwater management, flood mitigation, community engagement, and biodiversity conservation into its design and function. By leveraging the natural and social attributes of the square, Ponorogo can better withstand and adapt to the impacts of climate change while fostering a sustainable and livable urban environment for its residents.

In short, aloon-aloon (city square/green open space) in the basic and true concept is not allowed to be paved because it represents the earth, absorbs the rainwater, achieves the city centre green cover, and mitigates urban overheating. In the modern urban planning concept, public green open space has a primary function (intrinsic) and an additional function (extrinsic). The primary functions of open public spaces are as follows: (1) To guarantee the procurement of open spaces; (2) regulates the microclimate; (3) provides shade; (4) absorbs carbon dioxide; (5) absorbs rainwater; (6) provides habitat to animals; (7) absorbs air, water and soil media pollutants, as well as; (8) provides shelter from wind (windbreak).

Additional functions include social and cultural functions, economic functions, and aesthetic functions. In an urban area, these four main functions can be combined according to the needs, interests and sustainability of the city, such as the protection of water systems, ecological balance and biological conservation (Republik Indonesia, 2008). Furthermore, in an urban area, open space has the main function of (1) maintaining the availability of land as a water catchment area, (2) creating urban planological aspects through a balance between the natural environment and the built environment that is useful for the benefit of the community, and (3) increasing the

harmony of the urban environment so that it is safe, comfortable, fresh, beautiful, and clean (Republik Indonesia, 2008).

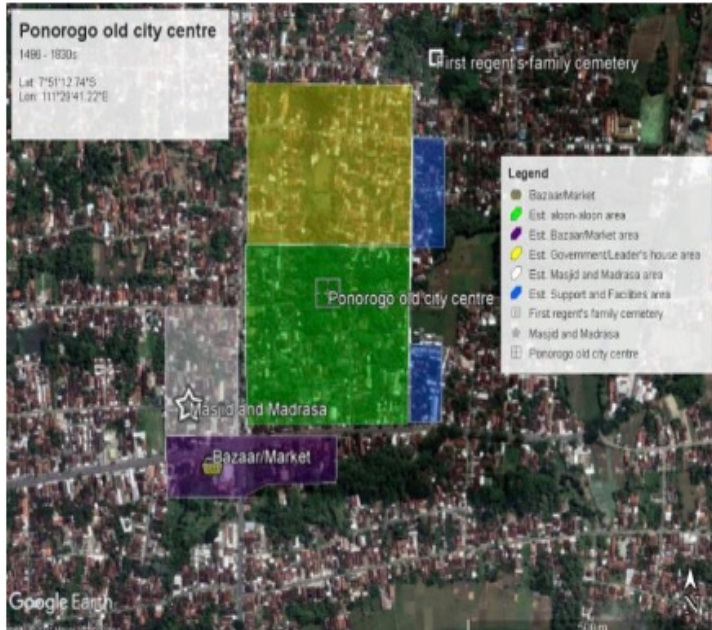


Figure 5. The city centre of Ponorogo with the position of the basic elements (1496 - 1830s) (Google, 2019)

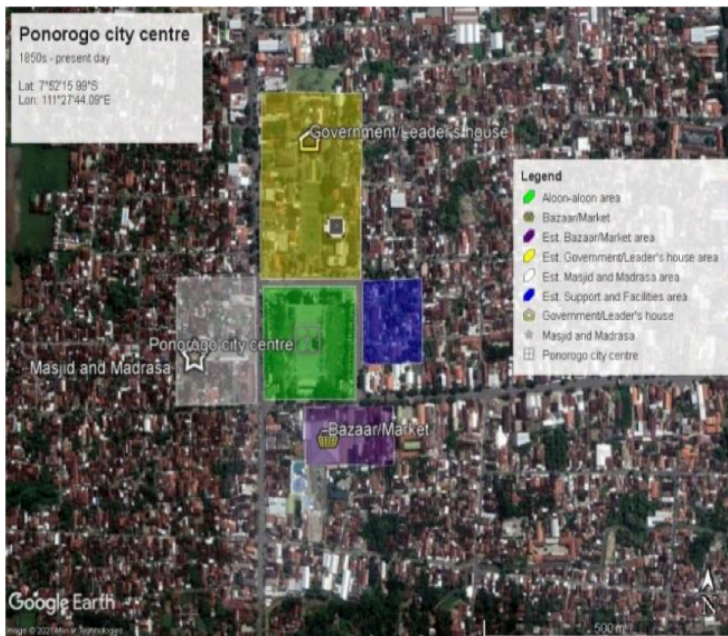


Figure 6. The city centre of Ponorogo with the position of the basic elements (1850s – present day) (Google, 2019)

What are the implementable strategies for the conservation of the Javanese city centre concept?

Limited efforts have been made to mitigate the neglect and urbanization pressures facing the Javanese city centre concept, necessitating comprehensive preservation and adaptive strategies. These strategies need integrated conservation efforts, community engagement, and educational campaigns to adapt the Javanese city centre concept to contemporary urban demands while preserving its cultural heritage.



Figure 7. The aloon-aloon of Ponorogo is around coordinate (-7.8713342, 111.4615631) (Haka TV, 2016)

The aloon-aloon (city square) in Ponorogo serves as a pivotal component in enhancing the city’s climate resilience through a combination of green infrastructure, community engagement, and adaptive management strategies. Historically, the square has evolved from a symbolic and functional space to a multifunctional urban asset capable of mitigating climate risks and fostering community resilience. Over time, the aloon-aloon has transformed in response to changing environmental conditions, urbanization pressures, and social needs. For example, initiatives to expand green spaces, improve stormwater management, and enhance biodiversity have been implemented to bolster the square’s resilience to climate-related hazards such as flooding, heat waves, and erosion.

One key strategy for increasing the climate resilience of the aloon-aloon involves the integration of green infrastructure elements, such as trees, grassy areas, and permeable pavements, into its design and maintenance. These features help to mitigate the urban heat island effect, reduce stormwater runoff, and enhance the square’s capacity to absorb and retain rainfall. By strategically planting native vegetation and incorporating sustainable landscaping practices, the square can become more resilient to climate extremes while providing additional benefits such as air purification, carbon sequestration, and habitat creation for wildlife.

Community engagement and participation are essential for building climate resilience in the aloon-aloon. Through collaborative planning processes, residents, businesses, and local organizations can contribute valuable insights, resources, and support for climate adaptation and mitigation efforts. Public education campaigns, volunteer activities, and participatory design workshops can raise awareness about climate risks and empower community members to take proactive measures to protect and enhance the square’s resilience. Additionally, establishing partnerships with academic institutions, NGOs, and government agencies can facilitate knowledge exchange, capacity building, and innovative solutions for climate resilience in the aloon-aloon.

Political action plays a crucial role in advancing climate resilience initiatives in the aloon-aloon. Local policymakers, elected officials, and government agencies have the authority and responsibility to enact policies, allocate resources, and implement regulations that support climate adaptation and mitigation goals. By prioritizing investments

in green infrastructure, disaster preparedness, and sustainable urban development, policymakers can create an enabling environment for climate-resilient practices in the aloon-aloon and beyond. Furthermore, advocacy efforts, public-private partnerships, and international collaborations can mobilize additional support and resources for scaling up climate resilience initiatives in Ponorogo's city square.

Conclusion and Recommendations. Aloon-aloon (city square/green open space) is a crucial component, ideally unpaved to symbolize the earth, absorb rainwater, provide green cover, and mitigate urban overheating. Public green open spaces serve intrinsic functions such as microclimate regulation, oxygen production, and rainwater absorption, alongside extrinsic roles like social, cultural, and economic activities. In urban areas, open spaces serve to maintain water catchment areas, enhance urban environments, and promote harmony while protecting natural resources. The Javanese-style city centre embodies eco-Islamic principles, advocating for sustainable lifestyles, environmental stewardship, and equitable economic systems.

Contemporary urban planning must consider local wisdom and traditions. While preserving traditional values, it is imperative to adapt development concepts to meet the challenges of modern urbanization. The Javanese city centre concept remains relevant in the postmodern era, emphasizing environmental, economic, and social sustainability, with due consideration for microcosm and macrocosm correlations.

Understanding the authentic concept is essential to prevent misinterpretations and ensure continuity across generations. As Indonesia grapples with climate change, the Javanese-style city centre offers potential solutions, urging collaborative efforts at local, national, and global levels to address climate challenges through appropriate city planning and development initiatives. Thus, it's crucial to nurture, observe, and further develop the Javanese city centre concept to harness its potential for mitigating extreme climate changes in a volatile, uncertain, complex, and ambiguous (VUCA) world.

Mitigating and adaptative management strategies for enhancing the sustainability and resilience of the Javanese old city centre concept involves a combination of preserving traditional elements while integrating modern practices to address contemporary challenges. The first is to ensure the preservation and restoration of aloon-aloon (city squares) and other green open spaces within the city centre. Implement measures to protect existing vegetation and green areas to mitigate urban heat island effects, improve air quality, and enhance the overall environmental sustainability of the area.

The second is to encourage sustainable transportation options such as walking, cycling, and public transit infrastructure within the city centre. Develop pedestrian-friendly infrastructure, designated bike lanes, and efficient public transportation systems to reduce reliance on private vehicles, alleviate traffic congestion, and minimize carbon emissions.

The third is to implement heritage conservation policies to

safeguard historic buildings, monuments, and cultural landmarks within the city centre. Encourage adaptive reuse of heritage structures for mixed-use development, community facilities, and cultural institutions, preserving their architectural integrity while revitalizing the urban fabric and promoting economic sustainability.

The fourth is to integrate climate-responsive design principles into urban planning and development strategies for the city centre. Design buildings and public spaces with passive cooling techniques, natural ventilation, and green building materials to mitigate heat stress, enhance thermal comfort, and reduce energy consumption, contributing to climate resilience and sustainability.

The fifth is to implement sustainable water management practices to address flood risk and water scarcity within the old city centre. Develop green infrastructure solutions such as rain gardens, bioswales, and permeable pavements to manage stormwater runoff, reduce flooding, and recharge groundwater resources, promoting water resilience and environmental sustainability.

The sixth is to foster community engagement and participation in sustainable development initiatives within the old city centre. Empower residents, businesses, and stakeholders through education, training, and capacity-building programs on environmental conservation, heritage preservation, and sustainable living practices, fostering a sense of ownership and stewardship for the city's future.

The seventh is to establish collaborative governance mechanisms and partnerships between government agencies, civil society organizations, academia, and the private sector to coordinate efforts and resources for sustainable development in the old city centre. Foster multi-stakeholder dialogue, knowledge exchange, and collective action to address complex challenges, leverage expertise, and foster innovation in urban sustainability and resilience.

By implementing these mitigating and adaptive management strategies, the Javanese city centre concept can be enhanced to promote sustainability, resilience, and well-being for present and future generations, while preserving its cultural heritage and historical significance.

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Additional Data

- **Population Density:** 680 people/km²
 - **Gross National Income (GNI):** 4,870 USD (Higher-Middle Income)
 - **Gini Coefficient:** 36.1
 - **Human Development Index (HDI):** 0.713 (High)
 - **Type of Climate Intervention:** Hybrid
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