

3. Bandung, Indonesia

Wicaksono Sarosa, Wahyu Mulyana and Brian H. Roberts

3.1 INTRODUCTION

Bandung is the third largest city in Indonesia, and the capital of West Java Province. Located 150km southeast of Jakarta, the capital of Indonesia, it is a major centre for tourism, education and industry, and has played a significant role in the political, economic and cultural development of Indonesia. It has a population of 2.5 million, and forms part of the Bandung Metropolitan Area, which has a population of 8.2 million. The Bandung Metropolitan Area is administered by five local governments.

Photo 3.1 Pasupati Bridge, Bandung City



Credit: Hery Antasary, Bandung Planning Board.

Bandung was founded in 1488. The city was favoured by the Dutch as a settlement area because of its elevation, soils and climate, which is cooler than most Indonesian cities. The central area of the old city was planned by the Dutch in the nineteenth century for a population of 300,000 inhabitants. The city has far outgrown its original area and spilled over into surrounding districts.

Over the past three decades, Bandung has experienced high rates of urbanization. This has placed enormous pressure on the capacity of the city and metropolitan region governments to meet the demand for basic infrastructure, housing, and urban services.

Traffic congestion, waste management and poor planning have compounded the management and development problems facing the city. In February 2005, the city's Leuwigajah landfill was affected by a large landslide after heavy rain, killing 143 people.¹³³

The effects of poor city planning, management, and sprawling development led to the realization that the city's development practices were not sustainable.^{134,135} The community and academics called for improvements in the way the city was planned, managed and developed to make it more liveable, safe and sustainable.^{136,137} Partnerships have played a significant role in this change.

This chapter discusses key economic, governance, social, natural, physical and environmental issues facing the development and management of the city of Bandung. It presents examples of best-practice sustainable urban development initiatives.

3.1.1 Population, Planning and City Development

Indonesia has experienced a period of rapid urbanization since the 1980s. Currently, 53.7 percent of the population live in urban areas.¹³⁸ It is predicted to be 66.6 percent urbanized by 2035.¹³⁹ Between 1990 and 2015, Indonesia's urban population grew from 55 million to 137 million. Urbanization growth reached over 3.3 percent per annum in the 1980s, but has subsequently fallen to 1.5 percent per annum and is continuing to fall.

Rapid urbanization in Bandung has placed significant urban management pressures on planners, architects and local government officials. Bandung Metropolitan Area, also known as Greater Bandung,¹⁴⁰ has seen rapid population growth over the past two decades. This has resulted in significant urban sprawl, with large agglomerations in suburban areas having higher populations than the civic centre. In managing the housing, commercial and industrial demand, the city has seen a significant reduction of green space and agricultural land.

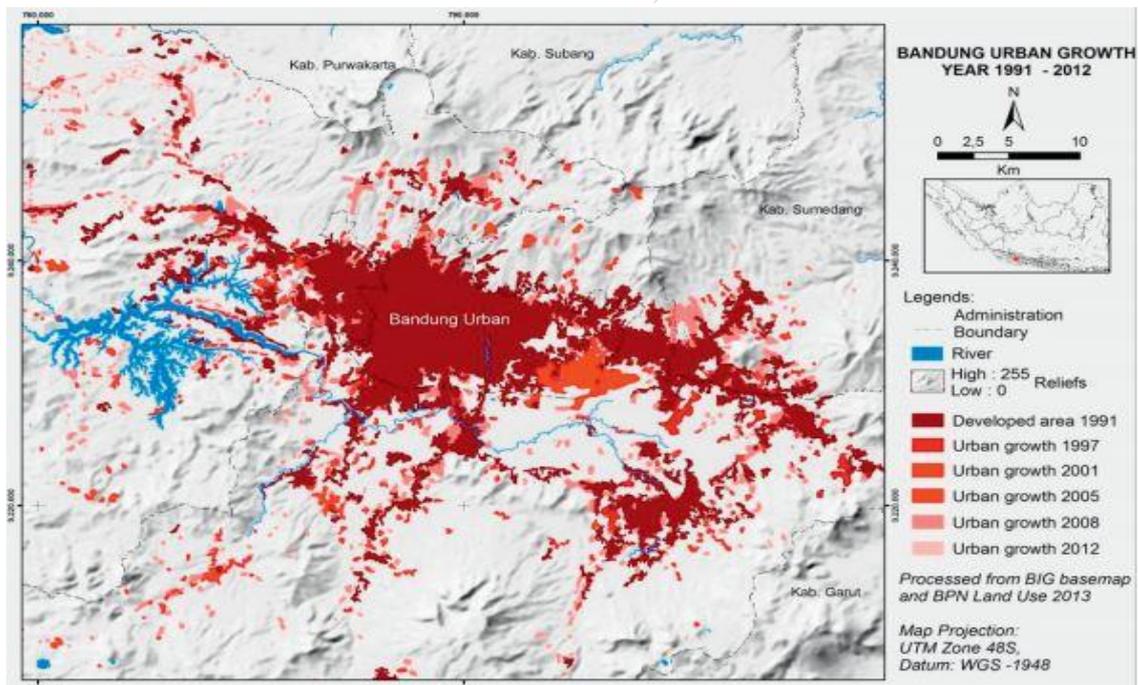
Table 3.1 shows the population, area and density of population for the Bandung Metropolitan Area. Between 1991 and 2012, its population increased from 5,079,348 to 8,199,892 at an average growth of 2.6 percent per annum. The built-up area also increased significantly during that period. According to one study in 2014, the physical growth rate of the urban area averaged 4.9 percent per annum.¹⁴¹ Urban densities continue to fall as the city sprawls in a northerly and southerly direction.¹⁴²

Table 3.1 Area, Population and Urban Density for the Bandung Metropolitan Area

Administrative Division	Area (km ²) 2005	Population 2010 Census	Population 2014 BPS Official Estimate	Population density (/km ²) 2010
Bandung City	167.27	2,394,873	2,575,478	14,125
Cimahi City	39.27	541,177	581,989	13,134
Bandung Regency	1,767.96	3,178,543	3,418,246	1,801
West Bandung Regency	1,305.77	1,510,284	1,624,179	1,159
Three Kecamatan in Sumedang Regency	112.00	264,342	n.a.	2,359
Metropolitan Area	3,392.27	7,889,219	8,199,892	2,325.65

Source: Based on data from Central Board of Statistics (BPS) Indonesia.

Figure 3.1 Growth of the Bandung Urban Area, 1991–2012



Source: V.S. Ardiwijaya et al., 'Bandung urban sprawl and idle land: Spatial environmental perspectives', APCBEE Procedia 10 (2014): 208–13, doi: 10.1016/j.apcbee.2014.10.040

During the Dutch colonial era, Bandung was a European-style city known as the 'Paris van Java'; its urban atmosphere with its artisan shopfronts, cafes and parks attracted comparisons to Paris. Bandung gained international recognition in 1955 when it hosted

the Asia–Africa Conference attended by leaders of 29 emerging and ‘non-aligned’ economies.

Since 1955, however, the planning and development of Bandung have been poorly managed. As a result, Bandung faces significant urban management and development challenges with serious water shortages, air pollution, inadequate waste management, severe traffic congestion, frequent flooding, urban sprawl and slum development, limited urban green spaces and a lack of business compliance with environmental regulations.

In 2013, when the city of Bandung had a change of government, a range of measures were taken to revitalize and improve the management of the city, spanning urban planning, infrastructure and governance. However, in the metropolitan area significant integrated planning, development and governance issues are still to be addressed.¹⁴³

3.2 ECONOMIC DYNAMICS

3.2.1 Key Economic Facts

Bandung is one of the most important economic hubs in West Java Province, contributing 3.3 percent of Indonesia’s GDP in 2010. Table 3.2 shows key economic growth indicators. Between 2008 and 2012, the economy of Bandung city increased by an average of 8.53 percent, which was significantly higher than growth for Indonesia (5.8%) and growth in West Java (5.86%). The city’s economic activities contributed toward 23 percent of West Java province’s economy during this period. GDP per capita for the Bandung Metropolitan Area in 2012 was approximately USD 1,400 compared to the average for Indonesia of USD 3,223.

Table 3.2 Key Economic Facts – Bandung

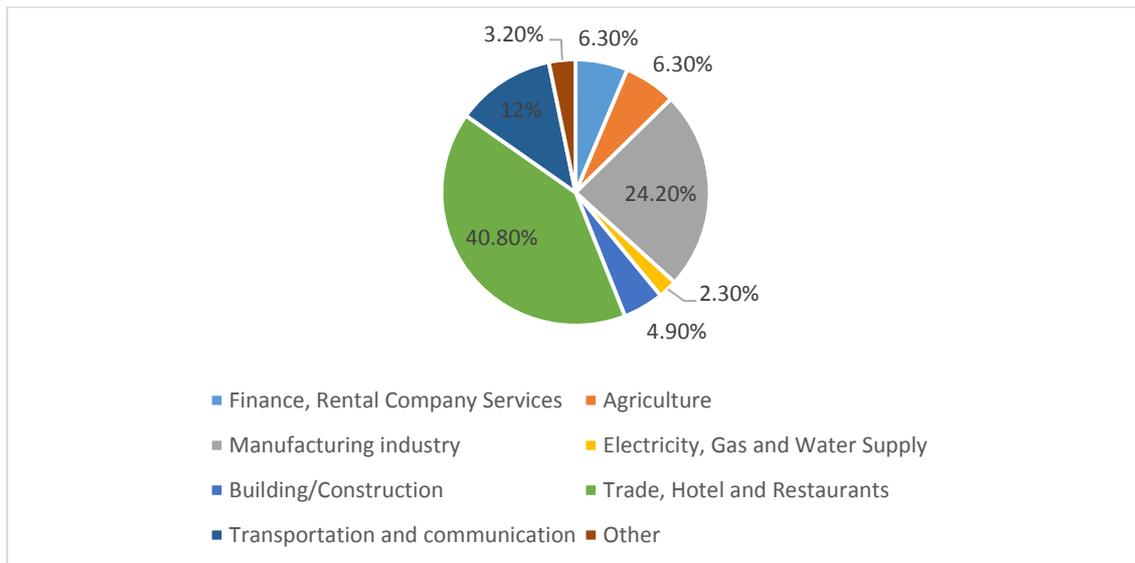
	Bandung	Bandung Metropolitan Area
Economic value (in constant value, 2012)	IDR 37.5 trillion (USD 3.89 billion)	IDR 107.7 trillion (USD 11.17 billion)
Estimated residential population (2012)	2,455,517	8,002,462
Employment (2012)	1,064,167	n.a.
GDP per capita (2012)	USD 1,585	USD 1,400
Unemployment rate (2012)	9.17%	n.a.
No. of businesses (non-formal, 2012)	71,204	n.a.
Key export sectors (2012)	Trade USD 669.2 million	n.a.

Source: Based on data from Central Board of Statistics (BPS) Indonesia.

3.2.2 Key Industry Growth Sectors

The Bandung economy has been gradually transitioning from manufacturing and agriculture to a tertiary service sector economy (Figure 3.2).

Figure 3.2 Economic Structure of Bandung City, 2008–2012, based on current prices



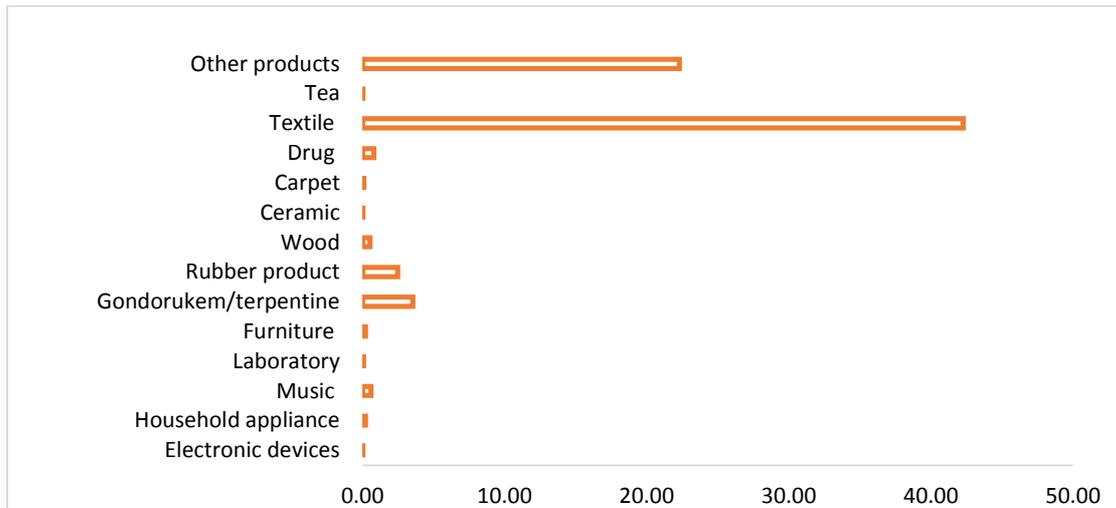
Source: Based on data from Central Board of Statistics (BPS) Indonesia.

Hospitality and trade are the key economic sectors, contributing to approximately 41 percent of Bandung's economy between 2008 and 2012. Manufacturing was previously the biggest contributor to Bandung's economy; it now holds second place at 24.1 percent of GDP. Transportation and communication are the third and fourth largest sectors of the city's economy.

3.2.3 Trade

Industrial products and creative industries dominate export commodities. Most manufacturing occurs in five industrial and trade clusters. The main focus of production in the five industry clusters are Cihampelas (jeans), Suci (T-shirts), Cibaduyut (shoes), Binongjati (knitwear) and Cigondewah (textiles).

Figure 3.3 Export Commodities of Bandung City in 2012, percent



Source: Based on data from Trade, Industry, SME's and Cooperative Agency, 2013.

The net value of exports has increased in relative terms from USD 512.2 million in 2009 to USD 603.2 million in 2014. Figure 3.3 shows the main export sectors for Bandung city. Textile products dominate 60–65 percent of total city-export products. Other export areas include electronic devices, home appliances, musical instruments, laboratory tools, furniture, turpentine, rubber products, manufactured woods, ceramics, carpet, medicines, and tea. These products are exported to Europe, the United States of America, Japan, Australia and New Zealand. The value of exports to those economies was 37.4 percent of the total export value of Bandung city.

The contribution of the manufacturing sector to the development of the economy of the Bandung Metropolitan Area, particularly exports, has declined due to increased regional competition. Local manufacturers and the Indonesian government have been slow to respond to economic and industry reforms to make export manufacturing more competitive. The ASEAN–China free trade agreement (ACFTA)¹⁴⁴ which came into effect in January 2016 will increase competition in the city's manufacturing industry sector. The private and business sectors are not really aware of the implications of ACFTA on the ASEAN Economic Community and the impact it may have on the free flows of goods, services and employment in ASEAN economies.

3.2.4 Economic Competitiveness

In a 2013 report, the Economist Intelligence Unit ranked Bandung 110 out of 120 global cities in overall competitiveness.¹⁴⁵ Table 3.3 shows the competitiveness ranking for Singapore (ranked 3rd most competitive city in the region) and the three largest Indonesian cities. Bandung ranked the lowest of the Indonesian cities surveyed with a score of 49.1/100. The city's highest overall competitiveness ranking was for physical capital (77.3%).

Bandung's low international competitiveness ranking is explained by a range of factors. Transport transaction costs are high because it is an inland city; most materials must be

imported and freighted by road from Jakarta International Port. The impact of environmental factors on water quality, questions of public health and institutional effectiveness, poor planning and development, and issues of urban governance are influencing the productivity of business.¹⁴⁶

Table 3.3 Economic Competitiveness of Singapore, Jakarta, Surabaya and Bandung, 2013

	Overall	Economic strength	Physical capital	Financial maturity	Institutional effectiveness	Social and cultural character	Human capital	Environmental and natural hazards	Global appeal
Singapore	70.0	46.0	100.0	100.0	87.8	77.5	69.8	87.5	43.2
Jakarta	63.1	31.3	98.2	83.3	94.8	95	68.7	75.0	25.5
Surabaya	62.7	31.3	100	83.3	94.7	87.5	68.9	83.3	18.9
Bandung	49.1	35.9	77.3	50.0	63.3	63.8	63.7	66.7	9.0

Source: Based on data from Economist Intelligence Unit, *Hot Spots 2025: Benchmarking the Future Competitiveness of Cities* (London: Economist Intelligence Unit: 2013).

3.2.5 Industry Clusters

Table 3.4 presents a Location Quotient (LQ) analysis to identify the comparative advantage of Bandung city compared to West Java Province for the period 2008–2011. The LQ provides a good indication of the levels of industry concentration and is a good measure of the presence of industry clusters.

Table 3.4 Location Quotient (LQ) of Economic Sectors in Bandung City, 2008–2011

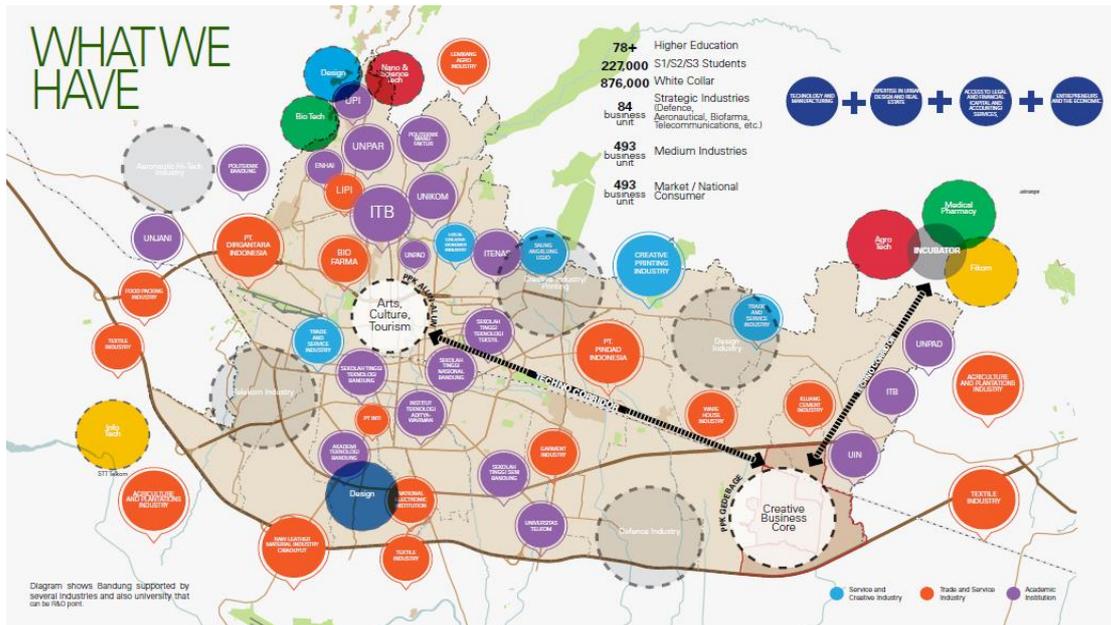
Sector	2008	2009	2010	2011	Average
Agriculture	0.02	0.02	0.02	0.02	0.02
Manufacturing industry	0.57	0.60	0.64	0.63	0.61
Electricity, gas and water supply	0.80	0.81	0.84	0.90	0.84
Building/construction	1.33	1.31	1.24	1.16	1.26
Trade, hotel and restaurant	2.10	1.90	1.81	1.83	1.91
Transportation and communication	1.94	1.94	1.69	1.61	1.80
Finance, rental and company services	2.24	2.30	2.27	2.24	2.26
Services	1.25	1.14	1.09	1.02	1.13

Source: Based on data from Central Statistical Board (BPS) West Java Province, 2008–2011, calculated by comparing GRDP Bandung and GRDP West Java Province.

There are five significant industry sector concentrations in Bandung. These are building and construction; trade and hospitality; transportation and communication; finance, rental and company services; and trade services. The sector with the highest score was the finance, rental and company services sector, with an average LQ of 2.26. The general services sector had the lowest average LQ of 1.13.

Four sectors have LQ scores below 1; these are non-basic sectors that serve only local needs. This LQ analysis highlights the need for the city to focus on synchronizing basic services with non-basic sector services.

Figure 3.4 Industries and Universities in Bandung



Source: R. Kamil, Bandung Economic Review: World Cities Summit Mayors Forum 2014. Singapore: World Cities Summit Mayors, 2014).

In terms of economic and business clusters, Bandung is home to the headquarters of many on Indonesia's major corporations, including Indonesia's largest telecommunication company (TELKOM), the National Post Office, the National Energy Institute (LEN), the military strategic industry (PINDAD), the telecommunication industry (PT INTI), the domestic aircraft industry (PT DI) and the pharmaceutical industry (Bio Farma).

These companies and others contribute to the creation of more than 876,000 jobs. Various universities and/or higher education institutions are also located in Bandung, contributing to the growth of creative industries within the city. There are more than 78 higher education institutions with approximately 227,000 students. Universities located in the area include Bandung Institute of Technology (ITB), Padjajaran University and Parahyangan University. The presence of universities and higher education is highly beneficial to the increasing art and designer community in Bandung.

3.2.6 Local Economic Development

Bandung has performed less well in local economic growth and development in recent years. A report by AusAID, the Swiss Development Corporation and the World Bank noted that:

some of Indonesia's major second tier cities, including Bandung, Yogyakarta, Cirebon and Semarang, have not experienced increases in real per capita Gross Regional Domestic Product (GRDP) over the last 15 years. In the period from 1993 to 2007, productivity in the cities declined by an average of 10 percent, which is equal to 0.7 percent Compound Annual Growth Rate (CAGR).¹⁴⁷

The economy of the city of Bandung and the rest of the Bandung Metropolitan Area showed some resilience through the 2007 global financial crisis but it has not been performing as well as it could. Bandung's local economic development and growth have continued, influenced by the contribution of export-oriented local commodities and the tourism industry. During the global financial crisis, Bandung became an attractive regional travel tourist destination for visitors from other cities, especially from Jakarta, during weekends. Shopping outlets, restaurants and the hospitality industry were the main drivers attracting tourists and visitors to the city.

To increase private and public investment, the Bandung city authority improved the enabling environment for civic investment. In 2008, the city government established a One Stop Service Unit – the Integrated Permit Services Board (BPPT). The city also introduced an online permit system, which applicants can access remotely.¹⁴⁸ These efforts have improved the service quality and reduced the time taken to obtain permit approvals.

In a local economic governance study of 243 cities/districts in Indonesia,¹⁴⁹ Bandung ranked 143rd with an index value of 60.7. Blitar City (in East Java province) had the highest ranking with an index value of 76.0. Bandung had a high score for the indicators of local regulation quality and local infrastructure policy. Lower scores were in the following indicators: access to land; interaction between local government and the business sector; and security and conflict resolution. The study indicates there is a need for significant improvement in the development of the local economy.

3.2.6 Innovation, Creativity and Business Entrepreneurship

Bandung has traditionally had a strong focus on the creative industries, which developed from its garment manufacturing, arts and design industries, and a vibrant, educated population. The textile and garment industry and various other creative activities have contributed significantly to local economic development. Factory outlets in Bandung are popular with tourists from neighbouring economies and cities.

Bandung has also acquired a reputation as an emerging creative city,^{150,151} building on its communities' traditions of innovation, progressive arts and music as well as cultural performances. In 2007, Bandung was internationally recognized as a creative city.

The city of Bandung is seen as a leader in creative industry development within Indonesia.¹⁵² In 2007, the city was selected for a pilot project of creative cities in the East Asia region. The fast growth of the city's creative industry was a spinoff from its cultural environment, location and local economic factors.

Despite a gradual decrease in the manufacturing industry, the creative industries continue to experience growth and contribute significantly to the city's economy. The creative industries include 15 sub-sectors, including: fashion design, handcrafted goods, architecture, publishing, printing, film and research, and development. These creative sectors contributed to around 14.4 percent (USD 400 million) in 2007 and are projected to grow further. The creative economy is not explicitly classified as its products include inputs from other sectors.

Table 3.5 Contribution of Small- and Medium-sized Enterprises (SMEs), Bandung

	Value in trillion IDR		%
SMEs	20.0		59.6
Micro	6.3		
Small	4.3		
Middle	9.4		
Large	13.9		40.4
GRDP	33.9		100.00

GRDP = gross regional domestic product; SME = small- and medium-sized enterprises.

Source: R. Kamil, 'Bandung economic review' (presented at the *World Cities Summit*, Singapore, 2014), http://www.worldcitiessummit.com.sg/sites/sites2.globalsignin.com.2.wcs-2014/files/Bandung_Economic_Review.pdf

Small- and medium-sized enterprises (SMEs) contribute almost 60 percent to the trade sector of the city's GRDP, while large enterprises contribute 40 percent to the city's trade sector (Table 3.5). SMEs – defined by the Central Board of Statistics (BPS) as micro-, small- and medium-sized enterprises employing between 4 and 99 people¹⁵³ – thus play a significant role in the city's economy.

Bandung's development strategy emphasizes strengthening the city's creative industry.¹⁵⁴ A roadmap for Bandung as a Creative City was prepared by the city government in close collaboration with key stakeholders and has become the key reference point for implementation of creative city programmes. It consists of five strategic programmes: creative city infrastructure projects; Bandung creative investment projects; creative human resources projects; Bandung hi-tech creative projects; and creative evaluation of regulation projects.

The Bandung Creative City Forum (BCCF) was established in 2008 as a vehicle to share ideas and bridge communications between creative communities. This platform brings together representatives from traditional arts, clothing and fashion, music and visual arts, urban enthusiasts and the urban heritage society. It has also seen support from journalists, intellectual property lawyers and urban planners.¹⁵⁵

Within the classification of the creative economy, tourism is another sub-sector that could potentially strengthen the competitiveness of Bandung, since the city is a popular weekend destination for visitors from Jakarta and other cities. Creative tourism activities encompass cultural and arts performance, food, shopping and education.

3.2.7 Economic Development Partnerships

Bandung city aims to become a service city that is clean, prosperous and friendly. To accomplish this, the Bandung city government formulated strategic programmes to develop a balanced economy that includes: industry development and business development; trade and business development; cooperative and business development; for small and medium enterprise development; city investment; development of tourism marketing and tourism products; and agribusiness development.¹⁵⁶

Bandung city government has been active in developing inter-municipality cooperation with other cities and provinces, both within Indonesia through bilateral and multilateral modes of cooperation, and with international cities and organizations.

Table 3.6 summarizes some of the partnerships and cooperation arrangements with other cities and districts in Indonesia. There are currently 24 sister cities including Cebu, Fort Worth, Suwon, Bari, Hangzhou, Liuzhou, Yingkou, Almaty, Braunschweig, Kuantan, Petaling Jaya and Seremban.

In addition to these partnerships, Bandung has been active in developing cooperation with various local and international corporations – including information technology-related companies – that can aid the development of the city. The Mayor of Bandung's intention is to make Bandung a smart city and the centre of information technology industries in Indonesia. Table 3.7 lists some of the cooperative agreements and partnerships developed with international organizations and cities.

Table 3.6 Inter-municipality Cooperation, Bandung

Year	City/District	Scope	Output
2008	District of Batanghari Jambi	Transmigration programme	Resettlement of 10 households in Batanghari District
	West Java Province	Joint cooperation on Gede Bade Stadium	The mutual agreement to finance the construction of the stadium with a 40% contribution from Bandung city
	Surabaya City	Inter-Municipal Development Cooperation	Technical assistance for the procurement of Bandung Electronic Procurement (BeP)
2009	Batam City	Economic Cooperation	Establishment of Bandung Business Centre in Batam in collaboration with the Chamber of Commerce
	Greater Bandung Metropolitan Area	Solid waste management	Cooperation in composting of solid waste in TPK Sarimukti
2010	Surabaya City	Information Technology	Development of Bandung integrated resource management and electronic procurement system
2011	Pohuwato District in Gorontalo	Transmigration	Resettlement of 10 households in Pohuwato District
	Greater Bandung Metropolitan	Solid waste management	Fund allocation for charged services, compensation, and negative impact compensation
2012	Kayong Utara District	Transmigration	Resettlement of 10 households in Kayong Utara District
	Kubu Raya District	Transmigration	Resettlement of 10 households in Kubu Raya District
	Surabaya City	All development sectors	Learning and sharing experiences on environmental management, food security, information and communication, trade, industry and tourism

Source: Compiled from data in *Akhir Masa Jabatan AMJ 2009–2012* [Mayor Completion Report].

Table 3.7 International Cooperation, Bandung

No	City/District	Scope	Output
1.	Education Attaché (German Government)	Education	Partnership to develop a school on culture and language
2.	French government	Transportation	Grants for technical consultant in formulating a Transportation Master Plan for Greater Bandung
3.	Petaling Jaya, Malaysia	Economy, trade, tourism, culture, and education	Letter of Intent and Memorandum of Understanding on cooperation on economy, trade, tourism, culture and education
4.	Shenzhen, China	Business, trade, science and technology	Joint declaration on a partnership between private and research institutions on tourism, culture, the textile industry and the Meetings, Incentives, Conventions and Exhibitions (MICE) industry

Source: *Akhir Masa Jabatan AMJ 2009–2012* [Mayor Completion Report].

3.3 STRATEGIC INFRASTRUCTURE AND ASSETS

3.3.1 Physical Infrastructure

Bandung has a broad range of strategic infrastructure and assets which supports the city's and the Bandung Metropolitan Area's economies. Bandung is an important logistics collection and distribution centre, and the city is well-connected by road networks and train to cities and regions in Java. Toll roads connect Bandung to Jakarta and other cities in West Java Province. The train is a reliable transport mode connecting Bandung with other cities in Java. In 2012, Bandung airport handled more than 1.8 million passengers; 1.2 million of these were domestic passengers. The dry port of Gedebage serves as the logistics hub for export-oriented commodities and transportation to Jakarta International Port.

3.3.2 Logistics and Information Systems

The city of Bandung is looking forward to achieving its smart city vision. The concept is to utilize ICT for monitoring and managing the various resources that exist within the city effectively and efficiently to maximize services to the citizens. Bandung is developing strategies to become a regional leader in the field. Two important application tools for

smart city development were created to enhance local governance: The Bandung Integrated Resource Management System (BIRMS) and the Bandung Command Centre.

- *Bandung Integrated Resource Management System (BIRMS)*

BIRMS is an integrated local development and governance system that links the activities from planning, budgeting, implementation, monitoring and performance evaluation. BIRMS consists of several applications:

- e-Project Planning includes a web-based application to facilitate detailed activity planning based on time, budget allocation and volume
- e-RUP consists of the procurement plan that will be carried out in the ongoing fiscal year
- e-Procurement allows service providers to make applications online
- e-Contract is a system to regulate contract arrangements and direct procurement from the contractual process through to financial disbursement
- e-Swakelola is a system to regulate procurement through the 'self-management' route
- e-Progress is a work documentation reporting system as a prerequisite for financial claims
- e-Performance is a performance web-based monitoring and evaluation system
- e-Asset is an asset information system based on e-Procurement and e-Contract

The implementation of BIRMS is an important partnership between agencies, which has helped to improve transparency and accountability of local government in conducting all local development and management processes.¹⁵⁷

- *Bandung Command Centre*

The Bandung Command Centre is a flagship project designed to achieve the vision of Bandung becoming a smart city. The centre was established early in 2015 in partnership with the Bandung Institute of Technology (ITB) to improve the delivery of public services.

Photo 3.2 Bandung Command Centre



Credit: Command Centre Beroperasi, (Command Operation Centre) Bandung Menuju Smart City.

The centre consists of a digital control board allowing city staff to remotely monitor traffic and manage crises in the city. It collects information from digital sources such as social media, online media, government data, short message services (SMS) and surveys to make informed decisions to improve delivery of emergency services.

Bandung's smart city vision and the projects being developed will help to enhance data production and management. More effort will be required, not only to improve data collection in the sectors covered by the Command Centre but also to receive other types of data such as air quality, and water and energy consumption, as well as data related to solid waste management.

3.3.3 Assessment of Physical Infrastructure and Assets

The condition and level of physical infrastructure provision are vital to maintaining the city's competitiveness (Table 3.8). Bandung has experienced rapid urbanization and the capacity of the city's government to provide basic infrastructure has been very limited. Chronic infrastructure shortages have had significant negative impacts on the development of the economy and urban environment; and this has affected the quality of life and wellbeing of residents.¹⁵⁸ To begin addressing these issues, the Indonesian government as well as local governments have given priority to infrastructure development in forward development plans and budgets.

Water supply remains a critical problem. The provision of piped water to all areas of Bandung city is very limited. The city government is cooperating with cities and districts in the Bandung Metropolitan Area to increase water resources by using water from the

Citarum River. There is need for a single regional water authority for the Bandung Metropolitan Area to address inadequacies in water quality and distribution network systems.

The availability of urban open space is important for improved air quality and quality of life. While Bandung has more open space per capita than other Indonesian cities, the city government is making efforts to increase the availability of public open spaces to 20 percent of the urban area, and for private open spaces, to 10 percent. Because of poor planning and urban management in the past, Bandung will have difficulty meeting these targets.

Table 3.8 Status of Physical Infrastructure and Assets in Bandung City

Infrastructure Assets	Unit	2010	2012	2014
Length of road	km	1,185	1,236	1,236
Length of urban road in good quality	%	49.2	64.1	80
Number of vehicles	million units	1.21	1.35	1.53
Ratio of vehicle/length of road	unit/km	1,025	1,093	1,249
Coverage of HH with adequate water supply	%	65	69.2	n.a
Liveable houses	%	69.3	70.6	n.a
Number of transport passengers	people	5.8	6.1	n.a
Solid waste management	%	70	85	87.2
Access to water supply	%	67	72.4	n.a
Access of households to sanitation	%	70.9	n.a	n.a

Source: *Rencana Pembangunan Jangka Menengah Daerah (RPJMD)* [Local/Regional Medium Term Development Plan] 2014 and *Rencana Kerja Pembangunan Daerah (RKPD)* [Local/Regional Annual Development Work Plan] 2016.

Only 73 percent of the city has reticulated water supplies or access to safe deep-well potable water. As further urban expansion occurs, shortfalls in Bandung’s urban services infrastructure will widen unless municipal finances and budgets are increased. In the short term, securing additional resources or infrastructure is unlikely. Technical solutions are available to address some of the problems, but improvements in revenue collection for the use of services, and property taxes, are essential if the backlog of infrastructure is to be reduced. Reform of income tax collection systems and improved financial governance is crucial.

3.3.4 Public Infrastructure Reinvestment Plans

The development of infrastructure plays a critical role in achieving Bandung city’s vision 2013–2018 toward excellence, comfort and wellbeing. One of the missions is to increase environmental quality supported by adequate carrying capacity for sustaining the productive activity of the Bandung community. The principle of spatial planning is to integrate, as sustainably as possible, the spatial planning of urban development with ecosystem landscape. The spatial policies of the city and the Bandung Metropolitan Area must consider the environmental carrying capacity to maintain environmental services and quality of life.

The Medium-Term Development Plan (RPJMD) 2013–2018 outlines several important objectives to support spatial planning and infrastructure development.

Figure 3.5 The Focus on Infrastructure Development in Bandung’s Medium Term Development Plan (RPJMD) 2013–2018



Source: Kota Bandung, *Rencana Pembangunan Jangka Menengah Daerah (RPJMD)* [Local/Regional Medium Term Development Plan] 2013–2018.

Figure 3.5 shows the vision, mission and key elements of spatial and infrastructure development to be delivered under the RPJMD. The main objectives of the plan are to:

- Improve the spatial planning processes
- Provide urban infrastructure, settlement and sanitation that are adequate and equitable in meeting the communities' needs for urban services. The plans set targets for service delivery
- Implement a safe, comfortable, efficient, adequate, reliable and friendly public transportation system
- Improve environmental and disaster management.

The RPJMD 2013–2018 also includes specific proposals for infrastructure development for potential public–private partnerships between the Bandung government and investors. Specific proposals include:

- *High-Speed Train Jakarta–Bandung*

This proposed project aims to increase connectivity between Jakarta and Bandung. The total cost is about USD 5.5 billion, which is being funded by a consortium of Chinese and Indonesian investors. The high-speed rail will reduce travel time from Jakarta to Bandung to 35 minutes. Construction was scheduled to commence in early 2016, with the system operational by mid-2019. This high-speed train will further strengthen economic growth and activities in the economic development growth corridor between Bandung and Jakarta.

- *Bandung Urban Mobility Project (BUMP)*

BUMP outlines the vision for Bandung's transportation and infrastructure projects until 2031.¹⁵⁹ Bandung is experiencing rapid urbanization and, to meet housing demand and balance open space requirements, the city government supports higher density development and redevelopment. These factors cause significant transport and congestion problems due to vehicle growth (9.34%) increasing at a faster pace than road development (1.29%). This congestion will have an impact on the city socially and economically; it will also place significant pressures on environmental sustainability.

BUMP consists of four principles:

- An integrated strategy to fulfil human needs (life, work and play) through the creation of a Traffic Demand Management system. The most appropriate design in Transit Oriented Development (TOD) will be the redevelopment of the existing terminal and station
- Improvement of road networks as links between activity centres, not as a base for district development
- Public transport development (mass rapid transport) to include monorail, bus rapid transit, cable car, pedestrian lanes, bike sharing, school bus, etc.

- Improved traffic management using technology including an Automatic Tracking Control System to control traffic patterns and a mass public transportation performance support system
- *Technopolis Gedebage*

The Bandung Spatial Plan 2011–2031 outlines a development strategy for the eastern parts of Bandung to redistribute population and reduce the traffic burden in the city centre. The plan proposes to develop the Gedebage area into a new city centre and Technopolis (a technology city similar to Cyberjaya in Malaysia).¹⁶⁰ The area to be developed will have a special economic zone featuring business and government centres, and science and technology parks. The supporting infrastructure will include integrated terminals, retention ponds for flood control, toll roads and basic infrastructure. Bandung city has scheduled these works for implementation in the period 2014–2018.

3.3.5 Operation and Maintenance of Infrastructure

The cost of infrastructure operation and maintenance (O&M) is the responsibility of the Bandung city government. The key agencies responsible are: Road and Irrigation, Spatial Planning and Human Settlements, Transportation, and Environment. The central government's Ministry of Public Works and Housing is responsible for the O&M budget for inter-regional infrastructure such as road networks and flood control. The Bandung city government contributes to intra-city road maintenance.

3.3.6 Infrastructure Partnerships

The National Medium Term Development Plan 2015–2019¹⁶¹ states that infrastructure development should strengthen connectivity in Indonesia by achieving equitable development. The Plan encourages public–private partnerships (PPPs) in meeting budget requirements and encouraging economic investment. The government intends to use PPPs for sectoral and cross-sectoral infrastructure development. Since the local budget for infrastructure projects is limited, the Bandung city government is actively looking for private investors for future infrastructure projects.

The National Development Planning Board (Bappenas) publishes a PPP book annually consisting of a list of public-private partnership projects planned in Indonesia.¹⁶² The list consists of three categories: potential projects; prospective projects; and ready to offer projects. Several large infrastructure projects for Bandung were listed in the 2015 PPP book. These include the Bandung Light Rail Transit, the Integrated Gedebage Multipurpose Terminal (Railway) and the Solid Waste Management Improvement Project.

3.4 SOCIAL AND ENVIRONMENTAL SYSTEMS AND SUSTAINABILITY

Bandung has and is continuing to experience rapid urbanization. In 2008, Bandung had a population of 2.3 million with an approximate growth rate of 0.8 percent per annum; the

city is expected to reach a population of 4.1 million by 2031. A recent study of Greater Bandung found that the city has the capacity to host only 3 million people with a density of 200 people per hectare. Should the population of Bandung increase as predicted, the city, as it exists, will face significant problems across all areas of governance, particularly in the social and environmental spheres.

Four types of natural disasters threaten Bandung: volcanic activity, earthquake, flood and fire. Bandung city will also become more susceptible to extreme climate events, which increase the risks to property and public assets. Flooding risk is predicted to increase significantly due to the increasing intensity of rainfall runoff and vegetation clearance, particularly in the northern and southern parts of the city. Bandung city and the Bandung Metropolitan Area also have poor environmental management including wastewater and solid waste management control as evidenced by the Leuwigajah landfill disaster noted in the introduction to the chapter.

3.4.1 Labour Markets and Human Resource Development

The quality of life in the Bandung Metropolitan Area is improving. The human development index (HDI) for Bandung city showed an increase from 77.51 in 2006 to 79.47 in 2013. Table 3.9 shows the overall education, health and purchasing power HDI indicators for Bandung for the period 2006–13. The Bandung HDI is relatively higher than the HDI levels for Indonesia as a whole or its provinces. The education index in Bandung is relatively high because of the high literacy rates and generally good education systems in the province. The purchasing power index is lower than other secondary cities in Indonesia because of lower per capita wages and GDP.

Table 3.9 Human Development Index (HDI) for Bandung City, 2006–2013

Year	HDI	Education	Health	Purchasing Power
2006	77.51	89.26	79.28	63.99
2007	78.09	89.56	80.65	54.04
2008	78.33	89.71	80.97	64.27
2009	78.71	89.83	81.08	65.22
2010	78.99	90.09	81.22	65.66
2011	79.12	90.14	81.32	65.90
2012	79.32	90.25	81.35	66.35
2013	79.47	90.44	81.38	66.59

Source: Central Board of Statistics (BPS) 2006–2013.

Table 3.10 Employment Conditions in Bandung City, 2008–2012

Indicator	2008 (%)	2012 (%)
Labour participation rate	60.06	63.14
Job seekers placement rate	11.20	45.77
Open unemployment rate	15.27	9.17
Labour safety and protection rate	82.99	86.32
Industrial-relations conflict resolution	84.43	67.78

Source: Kota Bandung, *Rencana Pembangunan Jangka Menengah Daerah (RPJMD)* [Local/Regional Medium Term Development Plan] 2013–2018.

In Bandung city, labour participation rates increased between 2008 and 2012 (Table 3.10). The unemployment rate for the city of Bandung is relatively higher (9.17%) than West Java Province (9.08%) and the average for Indonesia (6.14%). This is explained by the decentralization of manufacturing employment to other parts of the Bandung Metropolitan Area.

The trade industry is the leading employment sector and contributes to 36.4 percent of employment, equating to 387,828 workers. Manufacturing ranks second and contributed 24.1 percent of jobs or 256,452 workers in 2012 (Table 3.11).

Data on informal sector employment is difficult to obtain for Bandung and many secondary cities in Indonesia. Informal sector employment exceeds 70 percent¹⁶³ and is probably much higher.¹⁶⁴

Table 3.11 Employment by Sector of Persons Age 10+, Bandung City, 2012

Employment by Sector	No. of People	Contribution (%)
Agriculture	9,012	0.85
Mining	1,954	0.18
Industry	256,452	24.10
Electricity, gas, water supply	3,953	0.37
Building	41,904	3.94
Trade	387,828	36.44
Transportation	63,222	5.94
Bank and financial service	57,818	5.43
Services	242,024	22.74
Total	1,064,167	100.00

Source: Central Board of Statistics (BPS), Labour Planning in Bandung 2012–2017.

3.4.2 Environmental Management and Sustainability: Policies and Measures

Bandung city recognizes the urgent need to address solid waste management, water supply provision and wastewater treatment management. Identifying solid waste disposal sites is a significant issue, following the Leuwigajah landfill disaster.¹⁶⁵ The debate between using landfills or advanced incineration technology to convert waste to energy remains unresolved with community groups protesting against the pollution caused by

combustion. The city and the Bandung Metropolitan Area governments are examining new clean technology options for managing solid waste.

At the community level, the city has encouraged communities to implement a 3R (reduce, reuse, recycle) system that applies to five temporary disposal sites. A waste bank to collect non-recyclable waste has been introduced in some communities.

3.4.3 Partnerships

In recognition that Bandung must become a competitive and smarter city, the city government has begun to focus its efforts on improving the quality of human resources to support the development of the local economy. The city government is pursuing partnership programmes for capacity development to improve the skills and capabilities of the labour force, including a business plan with the Chamber of Commerce for Small and Medium Enterprises; vocational training with the automotive and engineering sectors, and knowledge sharing exchange programmes with other Indonesian cities.

3.5 URBAN GOVERNANCE

Bandung is an autonomous city governed by two main bodies: The Executive (Mayor and Vice Mayor) and the legislative (local parliament). Both are elected by the community to serve five-year terms. At the Executive level, the Bandung city government comprises the office of the Mayor and Vice Mayor, the city secretariat and the city agencies/boards. There are 17 local agencies and 7 technical boards responsible for a range of activities mandated by local governance law. At the lowest level, the city has sub-district and village officers who are responsible for providing public services to the community. The city government has more than 25,000 employees.

3.5.1 City Vision

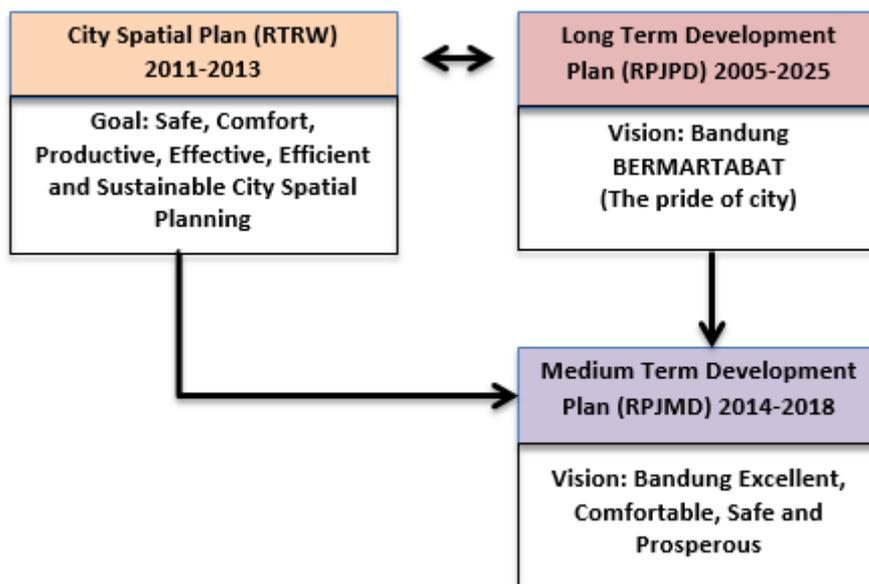
The Bandung city government has a responsibility to plan for and deliver a broad range of services. Local government laws mandate the preparation of spatial, physical, social and financial plans. Unfortunately, like many cities in Indonesia, there are enormous challenges in integrated planning and budgeting, especially in integrating different plans vertically and horizontally at the Bandung Metropolitan Area level.

As part of the planning and development process, the city has developed a vision to guide its future development. The vision provides the focus for the city's spatial plan and its development plans. The City Spatial Plan consists of spatial utilization plans and city structure plans. The Development Plans are socioeconomic plans for the long term (20 years) and medium term (5 years). Figure 3.6 shows the relationship between the city's vision on the City Spatial Plan and the Local Development Plans.

The Local/Regional Medium Term Development Plan (*Rencana Pembangunan Jangka Menengah Daerah*, or RPJMD) 2013–2018 is an explicit policy document that reflects the vision and mission of the elected Mayor during the five-year term. The main agendas of the Mayor indicated in the plan's mission and objectives include:

- Making Bandung a liveable city through spatial planning and infrastructure development. Targets include better waste management (to be achieved within two years); a flood-free city (two years); organized public street lighting (three years) and a congestion-free city (three years).
- Improving local governance.
- Strengthening the self-sufficiency, capacity and competitiveness of communities through the creation of business incubators; new job opportunities; scholarships for students; incentives for teachers; and local food subsidies.
- Building a resilient and equitable economy.

Figure 3.6 Bandung City Vision – City Spatial Plan and Local Development Plans



Source: Authors.

3.5.2 Institutional and Urban Management Arrangements

Bandung city faces several issues and constraints in relation to institutional and urban management arrangements:

- A need for cooperation, partnership and networking among civil society organizations, local parliament and local government in dealing with local development problems
- The low capacity of the government apparatus based on the competency, technical skills and bureaucracy mechanism in development and financial management
- Inadequate transparency on government management
- The need for inter-regional coordination and cooperation among the local governments in Greater Bandung, particularly on regional issues such as solid waste management, water resources and water supply.

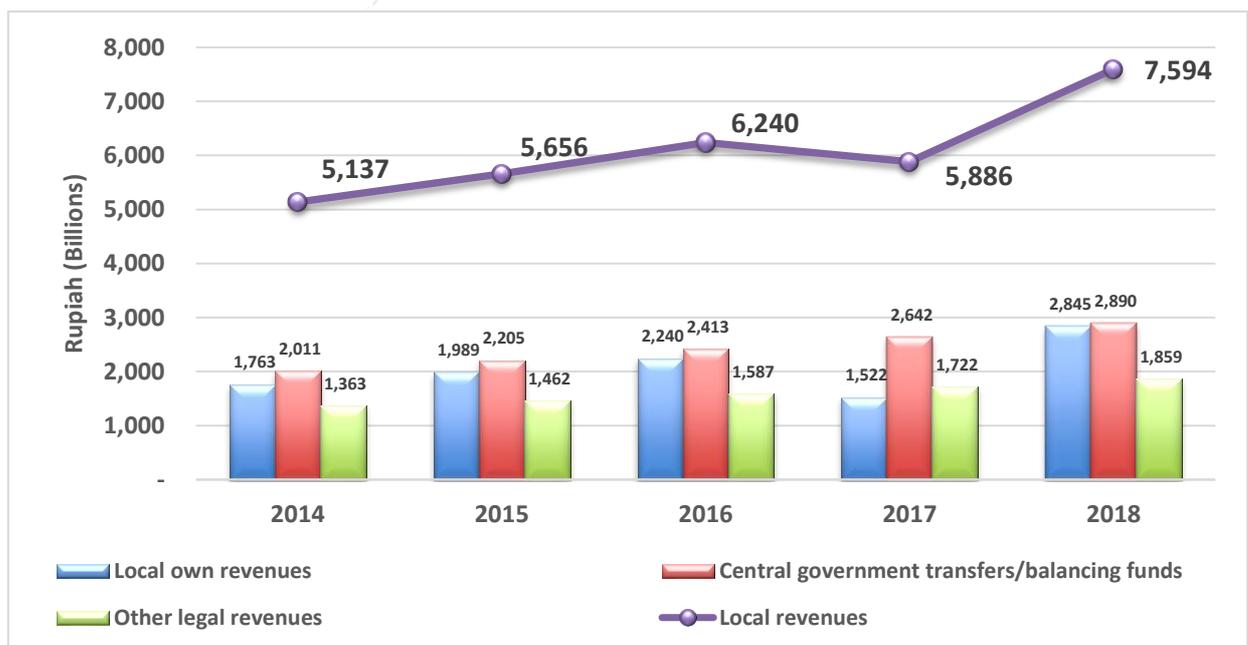
3.5.3 Public Finance

Bandung faces significant financial hurdles to achieve its desired development goals for the 2013–2018 Medium Term Development Plan. Its main source of public finance comes from central–local financing sources (70%) in the form of the General Allocation Fund (DAU) and Special Allocation Fund (DAK). Locally owned revenues (PAD) contribute to 30 percent of the city’s revenue. Most of this comes from local taxes and user charges. The DAU is allocated mostly to salaries. The DAK funds capital works and other development programmes; and the PAD is limited to financing other development needs.

In 2013, the local budget was IDR 4.76 trillion (USD 39.5 million) with an average annual growth of 16 percent. The capital expenditure for the city was approximately IDR 1.3 trillion (USD 10.8 million). To achieve the city’s development goals, the estimated investment needed in infrastructure is approximately IDR 84.5 trillion (USD 700 million). Given this, the city faces an impossible situation when it comes to raising the necessary capital, through public sources, to meet the backlog of demand for infrastructure. It is crucial that the city improves its revenue collection and mobilizes other financial sources to fund desperately needed municipal services to support the development of the city.

Figure 3.7 shows the revenue projection in 2014–2018 for the three primary income sources. The challenge for Bandung city is that central and provincial government sources of revenue are rising faster than the PAD, leaving the city vulnerable to changes in Indonesia’s revenue-sharing arrangements. The reliance on government funding is not sustainable. The capacity to run budget deficits is very limited unless forward estimates in revenues streams can be shown to improve.

Figure 3.7 Revenue Projection for Bandung City, 2014–2018, in billion IDR



Source: Reproduced from data RPJWR 2014–2015.

The city does not have a credit rating. Nor does it have an accounting system that enables assets and liabilities to be recorded on a balance sheet to establish a basis for achieving a credit rating. Some public assets are underperforming, and because of the failure to depreciate assets and operate sinking funds for their replacement, they are net liabilities to the city. Reform of the city's financial management, accounting and revenue collection systems is a high priority. These include the introduction of a market value tax rating system, accrual based accounting, the right to issue notes and bonds, and greater access to sub-sovereign lending through commercial and international development banks. The latter will require legislative changes at central government level, but is essential to creating greater competition in local government financial markets.

Table 3.12 Local Partnerships for Sustainable Development in Bandung City

City	Economic	Governance	Infrastructure	Research and innovation	Labour and skills	Social and environmental	Technology
Government	Indonesia: Urban renewal for slum areas (rental flat housing)	West Java Province: Gelora Bandung Lautan Api (BLA) Stadium	Singapore: Capacity building for local officers	Indonesia: Bus rapid transit France: Cable car	OECD: Green growth	US: Road safety	Japan: Smart city and bio digester
City	Sister Cities Programme	Batam: Bandung Business Centre	Citynet UCLG ASPAC	Surabaya: Bandung Integrated Resource Management System (BIRMS)	Other districts in Indonesia: Transmigration programmes	Greater Bandung: Solid waste management	Surabaya: Information Technology
Global business			Bloomberg: Road safety	JSCA: Research on smart cities		Companies from the Netherlands: Water supply	
Member-economy level business	PT BPJS: Health insurance	PT BPJS and bank: Employment opportunities		High-speed train (Jakarta–Bandung)			
Local business	Technopolis development	LED Org		Cable car (sky bridge) School buses (CSR)		Thematic parks (CSR)	
Public utilities				Public–private partnerships (PPPs)			
Public institutions			Local higher education – community empowerment programme			CDM	
Community		Community Empowerment Programme				Biopori	Village Wifi Development

ASPAC = Asia Pacific Network of Science and Technology Centres; CDM = Clean Development Mechanism; CSR = Corporate Social Responsibility; JSCA = Japan Smart Community Alliance; LED = Local Economic Development; OECD = Organisation for Economic Co-operation and Development; PT BPJS = Badan Penyelenggara Jaminan Sosial Kesehatan (Social Security Agency of Health); UCLG = United Cities and Local Governments;
Source: Authors.

3.6 PARTNERSHIPS FOR SUSTAINABLE DEVELOPMENT

Bandung city government has engaged in many types of partnerships to support the development and management of the city. Some existing and emerging partnerships occurring in the city between organizations and interest groups that have strong commitments to sustainability are shown in Table 3.12 and Table 3.13. Many of these involve formal arrangements; especially those associated with PPPs between government and business.

Table 3.13 Partnership Opportunities for Sustainable Development in Bandung City

City partnerships	Local level	Regional and member-economy level	International level
Economic and trade	Cooperation with other cities/districts on issues related to business and local commodities	Cooperation with the central government in promoting exports, e.g. participation in international expos	Cooperation with public and private companies in promoting exports, e.g. opening Little Bandung in Paris
Infrastructure	Inter-municipal cooperation among cities/districts on regional issues (solid waste, water resources, transportation)	Collaboration on infrastructure development with provincial and central governments (pre-feasibility study, feasibility study, market sounding, etc.)	Collaboration with and mobilization of potential foreign investors in infrastructure development projects
Social and environmental	Mobilization of local business and community to improve city conditions as part of corporate social responsibility agendas	Mobilization of the central government and the private sector to improve city conditions	Collaboration with international organizations on research, feasibility studies, etc.
Governance	Use of information technology to monitor city conditions and complaint mechanisms	Collaboration with provincial and central governments to implement bureaucratic reforms through information technology and capacity-building programmes	Collaboration with international organizations to build the capacity of local government officers

Source: Authors.

3.6.2 Examples of Best Practice Partnerships

The following describes two successful partnership and cooperative arrangements. Not all of these are best practices in sustainability, but they are management arrangements designed to support sustainability, resource leveraging, and value adding to development and services delivery.

3.6.2.1 Sister Cities Programme: Bandung–Suwon

In 1960, Bandung established its first sister city relationship, with Braunschweig, Germany. Since then, its international city alliances have expanded to include Fort Worth, Texas, USA; Yingkou and Liuzhou, People’s Republic of China; and Suwon City, the Republic of Korea.

Activities undertaken through the Sister City Programme include the construction of the Bandung City Chamber of Commerce building as the business centre for traders and private businesspersons from those cities. Bandung has participated in cultural events in Suwon, including the Food Festival in 2010 and 2011. In 2011 and 2012, Bandung and Suwon developed a youth and sports exchange programme. Suwon City has provided financial support in the form of a grant for the development of pre-elementary schools, materials, and tools for Bandung’s sub-districts and villages. Additional support is provided by local universities in Bandung, which provide language classes.

3.6.2.2 Corporate Social Responsibility and Parks Improvement in Bandung

In line with the vision to improve the city’s amenities, the Bandung city government plans to develop and improve 607 parks – including 60 thematic parks – to enhance further social and environmental sustainability. The city has introduced a policy of corporate social responsibility (CSR) for state-owned companies and encouraged private companies to do the same to improve public parks in Bandung. An additional feature of these upgrades includes the installation of wireless internet in these public spaces.

To date, 10 parks have been rehabilitated. Public awareness of cleanliness has improved significantly. Community initiatives have seen residents volunteering to keep the city clean. These volunteers monitor the condition of the parks and report to the authorities if they see any plants that need maintenance.

3.6.3 Initiatives to Promote PPPs

To speed up local infrastructure development, the Bandung city government established a special body to promote potential PPPs and attract private investors. This is a principal interest for the Mayor; and a major agenda for the Bandung government, which has called publicly for innovative ways to attract more private sector investment. The initial stage of the initiative has been the establishment a technical service unit focusing on PPPs.

3.7 CONCLUSIONS

Bandung is a city that has failed to manage the effects of rapid urbanization. A long running history of poor governance has seen the rise of suburban slums, inadequate infrastructure and poor access to services, lack of environmental management, significant traffic congestion, unconventional high-density development and poor planning. As a result, the city lost its competitiveness edge and is struggling to revitalize its economy and become a more dynamic and creative city.

While the city recognizes that it has significant challenges ahead, it has started to address these matters. It will take many years for past failures of poor urban planning, weak urban governance and environmental management problems to be overcome, but the changes in government and strong political leadership are beginning to turn Bandung into a smart and creative city.

There are still wider challenges at hand and these must become part of a broader agenda to improve the sustainability of the development and management of the city. Integrated metropolitan planning, management and development to deliver essential services are critical. The Bandung development problems will not be solved until they are addressed systematically at the Bandung Metropolitan Area level.

Second, the city must embrace more collaborative and inclusive means of urban governance. Vertical and horizontal governance administration, finance, resource and information sharing arrangements between the Bandung Metropolitan Area and local governments are weak. This, in turn, weakens the enabling environment for business, creates division over how the region's resources should be used, undermines the city's competitiveness and adds to the transaction costs of business and government.

There is widespread recognition and understanding in the community, and to a lesser extent government and business, of these challenges, and of the need for public, private and local collaborations to overcome them. Partnerships and other collaborative initiatives are part of a new model of sustainable development that the city has willingly embraced.

Research for this case study identified some valuable lessons on development sustainability and the use of partnerships to foster sustainable development. First, a recent change in government shows the importance of leadership and the need for government to create a vision and take action to restore confidence in Bandung as a good place to live, work and invest. The preparation of long-term infrastructure and upgrading plans and the encouragement of local community development initiatives have been critical in building resilience and confidence to help the city as a whole to become more confident about its future. Recent government initiatives to support CSR to encourage partnerships for the redevelopment of green spaces have been crucial to improving social amenities.

The Bandung economy is driven by trade, hospitality, and manufacturing. It is transforming rapidly from a manufacturing to a service-oriented economy. While it will continue to make a strong contribution to international exports, the transformation of the economy through a focus on creative, innovative and niche industry clusters is essential to ensure sustainable economic growth and development. Bandung, through its smart city

initiative, is beginning to develop as an economic hub and to attract small and larger businesses in the technology and telecommunication service sectors.

Finally, Bandung city recognizes that it cannot operate as a lone competitor. It is part of an emerging and fast growing urban economic development corridor connecting the major cities in Java with the rest of the Indonesian archipelago. Its future depends on collaborating with other cities and regions to secure significant infrastructure investment for projects such as the Jakarta–Bandung fast train project. The city also recognizes that it is part of the ASEAN region and that the development of city-to-city regional partnerships will be crucial to securing new markets, business development opportunities and tourism.

Bandung is no longer simply part of the system of cities in Indonesia but part of a larger network of competing cities in the APEC region. Its future sustainable development lies in developing stronger economic, social, governance and logistical ties with other cities in the region through partnerships and other collaborative initiatives involving government, business and the Bandung Metropolitan Area communities. Such partnerships will need to be negotiated between many local and regional stakeholders in an inclusive and open manner if Bandung is to realize its vision of a safe, liveable, productive, effective, efficient, well-planned and well-managed sustainable city.