Da Nang City, Viet Nam
1. Overview

Da Nang City is the transport, education and commercial hub of central Viet Nam. It is the main driver of the regional economy and has experienced rapid growth in recent years. Between 2000 and 2007 GDP increased an average 12% per year\(^1\) and its position along the East-West Economic Corridor (EWEC) means increasing connectivity and investment is expected. Da Nang is reliant on its large tourism, information technology and manufacturing sectors which are combined with a young and growing work force. At present, it is the 5\(^{th}\) largest city in Viet Nam with a population of approximately 1.1 million.

Da Nang is a coastal city, situated on the Hân and Cu De rivers. The wider hydrology is defined by the monsoon climate and tributaries of the transboundary Vu Gia - Thu Bon basin\(^2\). Seasonal fluctuations in upstream precipitation are a major control on flood and drought risk across Da Nang.

The city is subject to considerable attention from international donors and investors, so far completing development projects in the public transport, disaster resilience, solid waste, and energy sectors. Present waste management capacity is limited and there is little understanding of the plastic sources, sinks and pathways in Da Nang. Closing the Loop looks to make significant contributions in this area and help strengthen city-wide waste management practices.


2. Environment

**Location**: South Central Coast, Viet Nam

**Area**: 1,285km²

**Climate System**: Tropical Monsoon

**Average Yearly Precipitation**: 2075mm/year (30 – 533mm/month)

### Natural Resources

#### Water

Da Nang city is situated in the northeast Vu Gia – Thu Bon river basin³. Originating in the highlands of Quang Nam to the south, the Vu Gia – Thu Bon river basin covers an area of 10,318km² and feeds the coastal floodplains of Da Nang and Hoi An. This river basin plays an extremely important role in the life and socio-economic development of Quang Nam province and Da Nang city. The largest river in Da Nang is the Han, which flows through the city centre to discharge into Da Nang bay. It is fed by the Cau Do and Vinh Dien rivers⁴. Managing plastic pollution in the Han estuary will be a priority for the ‘Closing the Loop’ project.

The Cu De River catchment to the north is much smaller, only 425km², but still provides an important water supply. Other water features include over 546ha of surface water and extensive irrigation canal networks in the rural areas to the south and northwest.

Flow rates into Da Nang are strongly affected by seasonal precipitation and the operation of 10 upstream hydropower reservoirs. This creates significant economic and public health risks. During the wet season upstream storms can create extensive flooding, while in the dry period low flows risk compromising supply for the primary Cau Do water treatment plant⁵.

#### Forests

Da Nang has 67,150ha of forest cover, concentrated in the West and Northwest regions. Alongside their economic value these areas have a rich biodiversity. Approximately 21,000ha have been designated for environmental conservation.

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⁵ ISET-International, CCCO Da Nang, CVIWR, 2016. [Climate Change implications for Da Nang surface water management](https://openjicareport.jica.go.jp/pdf/12014940_01.pdf)
Minerals

Da Nang has a range of mineral reserves including slate, granite, aggregates and clays\textsuperscript{6}.

Climate Change

Climate change is expected to amplify existing water security pressures in Da Nang. Sea level rise, saline intrusion and an increasing frequency and severity of floods and typhoons pose major challenges to development\textsuperscript{7}.

\textsuperscript{7} Rockefeller Foundation, 2016. 100 Resilient Cities Report, Da Nang http://www.100resilientcities.org/strategies/da-nang/
Figure 2. Da Nang water resource map. Source: JICA, 2010

Figure 3. Da Nang elevation map. Source: JICA, 2010
3. Services

Waste Management

City waste management services are operated by the Da Nang Urban Environment Company (URENCO). Informal actors such as independent waste pickers, junk shops and scrap collection facilities also make a key contribution. Service coverage has improved over time and averages 75% across all districts.

The majority of collected waste is disposed at Khanh Son landfill in Lien Chieu district. This site manages 750 tonnes per day and is predicted to reach maximum capacity by the end of 2020. In response, a $97m treatment complex is in development for Hoa Nhon commune, 15km to the southwest. This aims to process 1,500 tonnes per day and operate under a public-private partnership.

Key waste management challenges in Da Nang include: inadequate infrastructure, limited technical capacity, weak value chains for recycling and a lack of data and monitoring.

**Total solid waste generation**: 1100 tonnes/day

**% Plastic waste**: 14-17%

**Total plastic waste generation**: 150 tonnes/day

Digital Readiness

In 2019 Da Nang Province was ranked first in the Vietnam ICT Index for the 11th consecutive year. This is the result of consistent investment in technical infrastructure, human resources and IT uptake across the city. Unique features include: a provincial open data policy, a comprehensive e-governance platform offering >1000 public services, and free public wifi along many of the city’s roads and public spaces.

**National Index Score**: 12.06/25

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12 URENCO, 2019.


14 Ibid: Vetter-gindele 2019


Global Digital Readiness Rank: 70
Global Networked Readiness Rank\(^{18}\): 63

**Water Provision**

Municipal water supply for Da Nang City is provided by the Da Nang Water Supply Company (Dawaco), which is mainly reliant on surface water from Cau Do River in the south of the city. The intake point on Cau Do River for Cau Do Water Treatment Plant is about 15km from the river mouth and often affected by saltwater intrusion during the dry season with salinities of over 1000 mg/l.

Water services and infrastructure in Da Nang have significantly expanded in recent years. Since 2007 urban coverage has increased from 52% to 93% in 2017, while non-revenue water dropped from 39% in 2007 to 15% in 2017\(^{19}\).


\(^{19}\) Wright-Contreras et al., 2020. ‘Water operators’ partnerships and their supporting role in the improvement of urban water supply in Da Nang’, *International Journal of Water Resources Development*, 36:1, 1-26, DOI: 10.1080/07900627.2019.16257
WASTE COLLECTION
The Urban Environment Company (URENCO) collects household and business waste daily and transfers it to landfills. At the household level, households bag their waste and keep it outside their homes for collection by URENCO staff. Although the formal waste collection system via URENCO covers most of the waste collection in Da Nang, an estimated 8 to 10 percent of waste is collected by the informal system, through a network of independent waste collectors (IWGs). They may collect waste from households with whom they have a personal relationship and then deposit it at transfer stations.

WASTE SEPARATION
While Da Nang has relatively high coverage rates for waste collection, waste separation is a challenge and is governed by a largely informal system that separates high-value materials for resale and sends the remainder to landfills. Most waste separation occurs after URENCO staff and IWGs collect waste. Waste separation is not a formal function of URENCO, although recent regulation requires separation at source. Economic incentives motivate URENCO staff to separate and recycle waste (staff can resell high-value recyclables). IWGs also separate and recycle to boost income.

TREATMENT

- **RECYCLING**
  URENCO staff and IWGs connect with agents to sell separated plastic materials for recycling. IWGs deal closely with smaller agents who depend on larger agents for the sale of plastic goods. These larger agents generally have the trucks and workers for a broader scale of operation, moving recycled materials to other parts of the country for treatment.

  Prices for recycled materials fluctuate based on international and domestic changes.

- **LANDFILLING**
  Landfilling is the primary method of waste treatment in Da Nang. URENCO transports waste items not recycled to landfills for disposal. The city’s landfills are not designed for separate disposal of organic and inorganic waste, and they currently operate beyond maximum capacity.

FINANCING SOLID WASTE MANAGEMENT SERVICES

- URENCO is funded by fees paid by households and businesses.
- The city determines the price per quantity of waste collected, and URENCO enters into waste collection contracts with businesses based on that price.

Source: Case study interview data

Figure 4. Summary MSW management process in Da Nang. Source: USAID, 2020.
4. Society

Viet Nam’s urban population has been rapidly expanding and reached 34 million in 2018\textsuperscript{20}. By 2050, 57% of people are expected to live in urban areas\textsuperscript{21}. Therefore, the provision of good quality housing, management of environmental pollution, and improving human capital will be key challenges for city managers in coming decades.

Da Nang has a population of around 1.1 million over approximately 270,000 households\textsuperscript{22}. Approximately 88% of residents live in the 6 urban districts with 12% in the more rural regions. Population densities can be as high as 19,712pp/km\textsuperscript{2} with most citizens residing in 2-5 story shophouses\textsuperscript{23}. Outside the city the rural districts are agrarian and sparsely populated (180 people/km\textsuperscript{2}).

Da Nang has a rich cultural history and is situated in close proximity to several UNESCO sites such as the Imperial City of Hue, Hoi An Old Town, and My Son Sanctuary. Several expansive sandy beaches present a further tourist attraction.

**City Population:** 1.1m, 4.1% annual growth.\textsuperscript{24}

**Average Population density:** 856 people/km\textsuperscript{2}

**Da Nang Human Development Index:** 0.803\textsuperscript{25} (0.752 national\textsuperscript{26})

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\textsuperscript{20} UN, 2018. Revision of World Urbanisation Prospects, https://population.un.org/wup/
\textsuperscript{21} Ibid: UN, 2018
\textsuperscript{23} Vetter-Gindele, Jannik, Andreas Braun, Gebhard Warth, Tram Thi Quynh Bu, Felix Bachofer, and Ludger Eltrop. 'Assessment of Household Solid Waste Generation and Composition by Building Type in Da Nang, Viet Nam'. *Resources* 8, no. 4 (December 2019): 171. https://doi.org/10.3390/resources8040171.
\textsuperscript{26} Ibid: UNDP, 2015.
Figure 5. Land use in Da Nang Province. Source: JICA, 2010.

Figure 6. Urban land use in Da Nang City. Source: JICA, 2010.
5. Economy

National

Viet Nam is the 6th largest economy in Southeast Asia. It experiences annual economic growth of around 7%, and has seen a 4x increase in per capita GDP since 1990. By 2050 Viet Nam is projected to be one of the world’s fastest growing economies, averaging 5% per year. Ongoing improvements in living conditions, life expectancy and literacy rates are expected to continue.

The 2020 COVID crisis has increased short-term economic and social uncertainty with national growth expected to drop to 2.7% this year. However, recent IMF projections expect economic growth to strongly rebound to 7% by 2021.

GDP: $245bn

GDP per capita: $2,567

Economy by Sector:

- Agriculture – 2.7%
- Industry/Construction - 34.7%
- Services – 61.7%

City

Da Nang experiences even faster growth than the national average. Between 2000 and 2007 GDP grew at 12.3% per year and while this was initially driven by a strong industrial and construction sector, Da Nang has now transitioned into a majority service economy. Tourism, IT, tech and finance drive economic activity as Da Nang establishes itself as an international transport and tourism hub. As such, development indicators show better quality of life in Da Nang than both the surrounding rural provinces and the national average. It is expected that by 2020, GDP of Danang’s service sector will account for 55.6%, industry and construction 42.8%, and agriculture accounts for 1.6%. The proportion of city GDP will account for 2.8% of the national GDP. Meanwhile, GDP per capita aims to reach 4,500 - 5,000 USD by the end of 2020.

Due to its strategic location, economic incentives and growing work force, Da Nang is subject to large sums of foreign private investment. As of 2019 Da Nang had registered 812 international investment...

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32 Danang UP1, 2013. ‘Final Report – Adjusted Master Plan of Da Nang City to 2030 and a Vision to 2050’.
projects, representing over $3.47bn. Industrial zones are centred along the North-West bay area with further activity found on the eastern bank of the Han River. The city’s business districts and high density residential zones can be found on the western bank. Additionally, several large technology, science and business parks are in the planning stages.

**GDP:** $3.12bn

**GDP per capita:** $3,059

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33 Ministry of Planning and Investment, 2019. ‘Da Nang Continues Drawing More Investment’

34 VCCI, 2017. Investment Guide to the Central Region of Viet Nam.
6. Governance

National

Viet Nam is divided into 63 provinces with 5 centrally-administered cities. Viet Nam is a single-party republic and administered under the 2003 Law on the Organisation of People’s Councils (HDND) and People’s Committees (UBND). In practice this relates to a 3-tier governance structure: provincial, district, and local (ward/commune). Decision-making is hierarchical with administrative bodies directed and accountable to those above them.

City

Da Nang is one of the ‘Class-1’ designated cities under central administration. Da Nang is composed of 8 districts.

6 Urban: Hai Chau, Thanh Khe, Son Tra, Ngu Hanh Son, Lien Chieu, and Cam Le.

2 Rural: Hoa Vang, Hoang Sa (islands).

56 Local: 45 Wards (Urban), 11 Communes (Rural).

The Da Nang People’s Committee is chaired by Mr. Huynh Duc Tho and based in Hai Chau district. There are 22 city departments and agencies across Da Nang.

Transboundary Considerations

Upstream hydropower reservoirs: Dak Mi 4, Song Bung 2, Song Bung 4, A Vuong 1, Song Con 2.

Da Nang and Quang Nam River Basin Organisation

This is a joint coordination committee established in 2017 following a mutual agreement between Da Nang City and Quang Nam Province. They aim to promote cooperation between the two provinces and implement Integrated Water Resource Management (IWRM) in the Vu Gia – Thu Bon Basin to help guide economic development and improve social security and ecological safety. The committee meet every six months and are hosted by each province rotationally.

Figure 7. Viet Nam national governance structure.

Figure 8. Da Nang district and local level administrative boundaries.
7 Key Plans, Policy and Regulations

Current policy and investment priorities include: managing further expansion and land use change, improving transport connectivity and traffic flow, and developing water services and waste management.\[36\]

**Urban Development**

*Developing Da Nang – an Environmental City Plan.*

Provides a vision for city development for the period of 2008-2020. The major goals are to: (i) Prevent environmental pollution in residential areas, nature conservation areas and key tourist areas; (ii) improve the quality of water, soil, air; (iii) improve management capacity of environmental protection; and (iv) raise public awareness on environmental protection.


Defines national development targets and trajectory up to 2020 and produced by the Ministry of Planning and Investment. To be updated with a 2021-2030 plan by the 13th national congress.

*Danang City Socio-Economic Development Master Plan toward 2020.*

This aligns national socio-economic targets with Da Nang’s city planning and presents the urban development agenda to 2020. Goals include 100% wastewater treatment and 70% solid waste recycling by 2020.

*Adjusted Master Plan for Socio-Economic Development of Da Nang City Towards 2020, with a Vision to 2030*

In March, 2020, Prime Minister Nguyen Xuan Phuc signed Decision No. 393 approving adjustments to the ‘Da Nang City Socio-Economic Development Master Plan toward 2020’. The adjusted master plan focuses on developing 3 primary pillars: tourism, high-tech industry and marine economy.

*Da Nang City Master Plan for Solid Waste Treatment until 2030, Vision to 2050*

Promulgated under a People’s Committee Decision in 2016, Da Nang has set the target to achieve 100% domestic solid waste collection and treatment by 2030. Treatment by recycling, reuse, energy recovery and composting aims to reach 90% and 95% by 2030 and 2050 respectively. Full waste segregation must also be achieved across the whole city during this same period.

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Environment

*Law on Environmental Protection. 2014*

Viet Nam’s primary environmental law presenting statutory guidelines on environmental protection, measurement and resource use. Includes provisions on climate change and international cooperation, *National Strategy for Environmental Protection 2010-2020.*

Defines national pollution prevention, environmental protection and biodiversity targets to 2020, with a vision to 2030. Targets include 95% urban solid waste collection and 85% reuse/recover/recycle by 2020. Produced by the Ministry of Natural Resources and Environment and to be updated with a 2021-2030 policy, currently in draft stages.

*Law on Marine and Island Resources. 2015*

Defines the rights, obligations and responsibilities for stakeholders managing marine and island resources. Includes a master plan on coastal resource use, pollution control and outlines marine monitoring and surveillance.

*Law on Water Resources. 2012*

Addresses the management, protection, exploitation and use of water resources. Mandates the development of national and local master plans to prevent and mitigate water pollution.


National plan produced in alignment with the ASEAN marine debris framework. Developed by the Ministry for Natural Resources and Environment, UNDP and Norwegian Embassy.

Targets by 2025: 50% reduction in marine plastic litter, 80% of Marine Protected Areas (MPAs) to be free of plastic litter, establish monitoring across Viet Nam’s 5 major drainage basins.

Targets by 2030: 75% reduction in marine plastic litter and 100% of MPAs to be free of plastic litter.

**Sustainable Development Goals**

*National Action Plan for the Implementation of the 2030 Sustainable Development Agenda. 2017*

**SDG 11.6:** Reduce the Adverse environmental impacts on people in urban areas, including by strengthening management of air quality, urban waste and other sources of waste.

**Lead agency:** Ministry of Construction.
**SDG 12.5:** By 2030, substantially reduce waste generation and increase the economic value of water resources through prevention, reduction, recycling, reuse, and recover of energies from waste treatment.

**Lead agency:** Ministry of Natural Resources and Environment; Ministry of Construction.

**SDG 14.1:** By 2030, prevent, significantly reduce and successfully control marine pollution of various forms, particularly pollution from land-based activities, including solid waste, waste water and organic substances pollution.

**Lead agency:** Ministry of Natural Resources and Environment.
8 Key Stakeholders

**Governing Institutions**

People’s Committee of Da Nang City

*Department of Natural Resources and Environment (DoNRE)*

*Department of Planning and Investment (DPI)*

*Department of Construction (DoC)*

*Department of Agriculture and Rural Development (DARD)*

Urban Environment Company (URENCO)

Urban Construction Planning Institute

Wharf/Dock Management Authority

**International Projects and Donors**

IUCN – Marine Plastics and Coastal Communities Project.

WWF – Plastic Smart Cities Initiative.

USAID – Integrated Waste Management Plan; Clean Cities, Blue Ocean.

JICA – Partnership Program on Solid Waste Management, Project for Promoting Segregation and Recycling in Da Nang City.


The Research Institute for Development (IRD) – Creating an Observatory for Measuring Occurrences in Society and Environment (COMPOSE)

**Non-Governmental Organizations**

Viet Nam Plastics Association (VPA)

Centre for Environment and Community Research (CECR)

Center for Consultancy on Sustainable Development (C4SD)

Pacific Environment – Vietnam Zero Waste Alliance

GreenViet
Greenhub

**Private Sector**

DANAPLAST – Danang Plastic Joint Stock Company

Coca Cola (Ekocenter in Da Nang City)

Coin for Change

Packaging Recycling Organization (PRO)

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