

Factsheet

Rajshahi City in Bangladesh

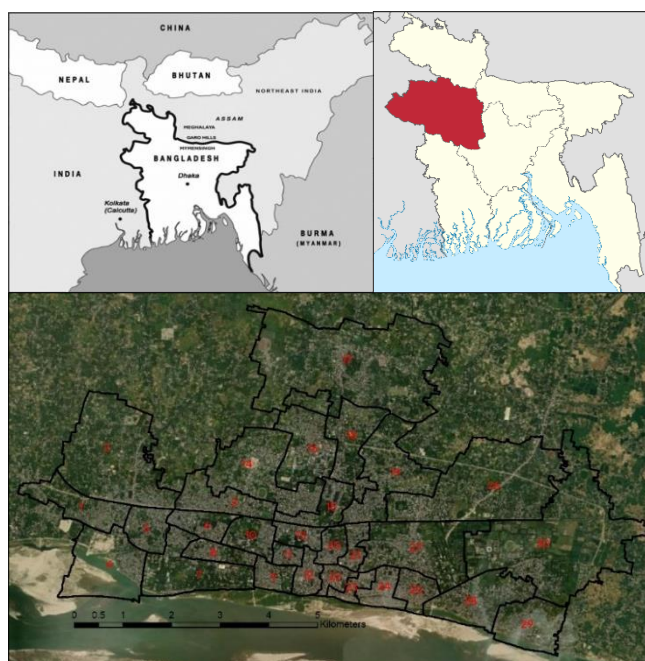
Location of the city

Rajshahi City Corporation (RCC) is located at 24.40°N 88.50°E on the northern banks of the river Padma near the Bangladesh-India border. It is situated about 245 kilometres from the capital city Dhaka.

About the City

Rajshahi is one of the first Municipalities in Bangladesh established in 1876. The city is divided into 30 different administrative wards. It is also one of the oldest metropolitan cities in Bangladesh. In addition to the RCC, other organisations working in the city are the Rajshahi Unnayan Kortipokkhko (Rajshahi Development Authority) for planning and developing the city; the Rajshahi Water Supply and Sewerage Authority (WASA) for the provision of water supply, sewerage and drainage system and Local Government Engineering Department (LGED).

Rajshahi is the fourth largest city and a major urban, commercial, and educational centre. The city of Rajshahi is the divisional headquarters of the Rajshahi division as well as the administrative district and is one of the oldest metropolitan cities in Bangladesh.



Rajshahi City Demography & Socio-Economic Characteristics

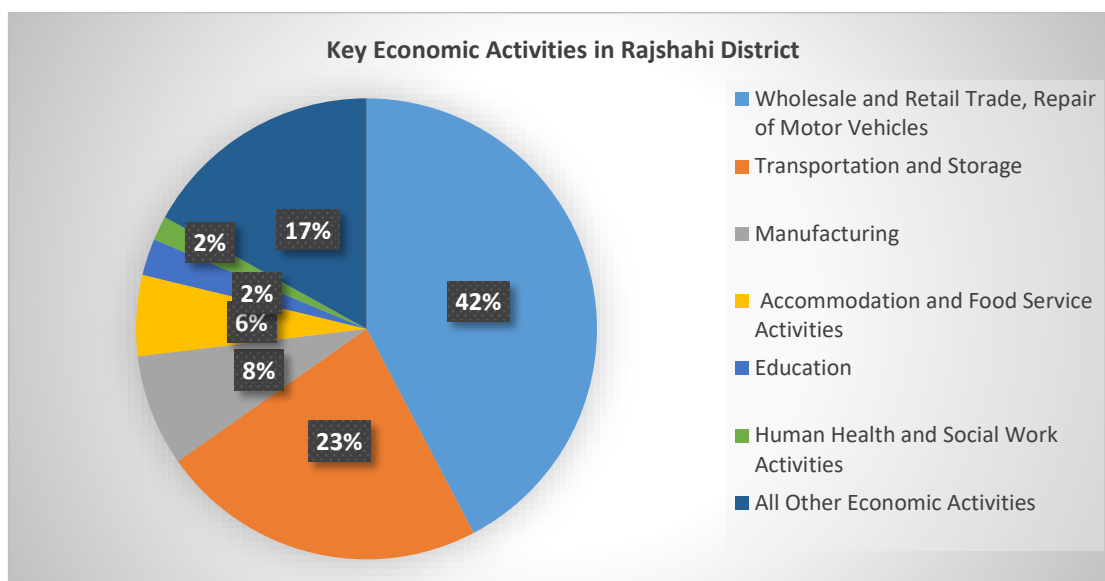
According to the Bangladesh Bureau of Statistics (BBS) population census 2011, the population of RCC was 448,087, with 231,700 males and 216,387 females. The population density was 2,487 persons/sq. km. The total number of households is 99,097 and 32 slums in the city. The literacy rate of the Rajshahi city is 73.96%

Indicators	Characteristics
Classification of the City	Plain
Location	24°22'26"N 88°36'04"E
Area	121 square kilometres
Population	448,087 (as per the 2011 census)
Density	4,318 persons per sq. km.
Slum Population	23,261 households with a population of 89,050 in Rajshahi Metropolitan area (Subedi, 2022)

Table-1: *Rajshahi city*, Demography

Source:

Over 42% of the household occupation is provided by trading, followed by the transportation sector with over 23%. About 17% of people are engaged in education-based activities. The manufacturing sector engages only 8 % of the population.



Graph 1: Main income source for households in Rajshahi District
Source: Economic Census 2013, District Report: Rajshahi

The city is one of the important administrative, educational, cultural and business center of the country. However, despite being located at an important riverbank, the industrial base of Rajshahi has not developed as expected. The process of industrialization could not keep pace with the rate of increase in population. Inadequate development of infrastructural facilities, shortage of capital and low productivity regionally acted as a break on the development of the economic base of the city like industry, trade and commerce. Rajshahi Textile Mills, Rajshahi Jute Mills, Rajshahi Sugar Mills and Silk Mills are the major industrial concerns in Rajshahi. The first two was established during the post-liberation period, while the third was established before liberation. A few major scattered industries, an industrial estate at Sopura with a handful of industries, public sector organizations, academic institutions, informal sector and trade & commerce, provide a major base for economic activities in the study area.

Infrastructure Services Status

The city-level services are provided by the Rajshahi City Corporations (RCC). The urbanisation rate and population growth are meagre in the city compared to other major cities in the country. The population density of the RCC area is only 8891.21 persons per sq. Km.

Infrastructure Status	
Water Supply	<ul style="list-style-type: none"> Rajshahi Water Supply and Sewerage Authority (RWASA) supplies water to meet the need of water demand through a distribution network (Aid, 2019,).

	<ul style="list-style-type: none"> • Water supply pipeline network - 712.5 km • It serves almost 70% of people (Aid, 2019,) • Remaining 30% of the population has access to water through tube wells with hand pumps (Uddin, 2011)
Sewerage	<ul style="list-style-type: none"> • The city has no sewerage system (Aid, 2019,) • Water-sealed pit latrines are used by about 70% of the households. (Ullah, 2013) • Simple pit latrines - 23% (Ullah, 2013) • The remaining 7% of the households do not have any sanitation facilities and defecate in the open (Ullah, 2013)
Solid Waste Management	<ul style="list-style-type: none"> • Solid waste generation - 358.19 metric tonnes per day 0.4214 kilograms per person per day (Habib, Ahmed, Aziz, Beg, & Hoque, 2021) • 79% to 85% of solid waste in residential areas and market areas is compostable (Haque A. K., 2017) • 140 recycle shops and most of them were located in the vicinity of stadium market in Rajshahi (Imran, 2015) • 1906 people were found to be involved in recycling activities of the city (Imran, 2015) • Every day an estimated 28.13 tons of recycled solid wastes were handled (Imran, 2015) • This recycled portion accounted for 8.25% of the daily total generated wastes, 54.6% of the total recyclable wastes and 68.29% of readily recyclable wastes (Imran, 2015)
Storm Water Drainage	<ul style="list-style-type: none"> • 12 primary drains whose total length is 44.8 km (Ullah, 2013) • The total length of the secondary drain is 42.69 km (Ullah, 2013) • 200 tertiary drains whose total length is 41.78 km (Ullah, 2013) • 132.27 kilometres of drains of various categories constructed (Ullah, 2013)
Transportation	<ul style="list-style-type: none"> • Commercial vehicles - 63% of traffic volume (Haque A.) • Non-commercial vehicle - 37% (Haque A.) • The road is shared by 8 major types of vehicles namely trucks, buses, utility vehicles, car, auto rickshaws, motorcycle, bicycles and rickshaw (Haque A.) • 10% of vehicular traffic consists of trucks (Haque A.) • 9% consists of buses (Haque A.) • 18% comprise auto-rickshaws, motorcycles, bicycles and rickshaws comprise 17% each (Haque A.) • 25% of the trip is for work-related purposes (Haque A.) • Educational purpose consists of 22% of the trips (Haque A.) • 4% of the trip is for shopping purposes (Haque A.) • Average distance travelled for shopping purposes is 1.5 km, for educational purposes is 1.2 km and for work-related activities is 2.5 km (Haque A.)

- 40% of total roadway are damaged with different types of damages such as peeling off the road, potholes etc (Rahman F. I., 2018, Vol. 3, Issue 2)

Table- 3: *Infrastructure services in Rajshahi city*
Source: *IRADe, 2022*

The table above (Table-3) indicates the level of services available in the city and the city faces an acute shortage of services in the city especially water supply and sanitation services. This not only creates a risk to the city in terms of developing city-level coping capacity and its economic sustainability.

Climate projections and Heatwave impacts in Rajshahi

According to the climatology specific to the region, it is the most affected region due to frequent extreme weather, frequent disaster events and its geographical location. The Rajshahi city holds these climatological characteristics such as salinity intrusion, extreme temperature, and drought are the main three climate change impacts faced by the region. Extreme poverty and poor coping capacity make people more vulnerable and change their normal living conditions.

The city experiences high temperatures during the pre-monsoon seasons (March to June), with an average annual maximum temperature of 34⁰ C, where the average annual minimum temperature is 11.5⁰ C. It is projected that the temperature to increase by 1.5⁰ C – 3⁰ C by 2050 relative to 1981 – 2010. The city also receives a good amount of rainfall, on average 1448 mm.

The Bangladesh Meteorological Department (BMD) uses the following parameter of a heatwave in the country:

Temperatures	Heatwave Category
36 to 38 degrees Celsius	Mild heatwave
38 to 40 degrees Celsius	Moderate heatwave
Above 40 degrees Celsius	Intense heatwave

Table- 4: *Heatwave by BMD*

Source: *Khan, Nazmul & Alam Saimon, Md. Sajadul & Jimmy, Abdun. (2020). Heat Wave and its Thermodynamic features over Bangladesh using Numerical Weather Prediction Model (NWPM) International Journal of Science and Business International Journal of Science and Business. 4. 44-52. 10.5281/zenodo.3839997.*

The climate change trends and their impacts on the city are as follows:

Description	
Climate Type	Tropical wet and dry climate (Koppen Climatic Classification)
Average Annual Maximum Temperature	34 ⁰ C
Average Annual Minimum Temperature	11.5 ⁰ C
Average Annual	1448 mm

Rainfall	
Height above Mean Sea Level	23 metres
Temperature Projections	<ul style="list-style-type: none"> • Temperature to increase by 1.5⁰ C – 3⁰ C by 2050 relative to 1981 – 2010.²
Rainfall observed trend	<ul style="list-style-type: none"> • 1542.1 mm to 2235.8 mm (Shamsuzzoha, 2015)
Rainfall projections	<ul style="list-style-type: none"> • Summer rainfall to decrease by 18.4% and 41.4% by 2050 and 2100 respectively from its base value of 819 mm in 2010 (Shamsuzzoha, 2015)
Extreme Events: Flash Floods	<ul style="list-style-type: none"> • In October 2004, a flash flood left at least 15 people killed in drowning, water-borne diseases and snake bites in two north-western districts and left over 50,000 people homeless (Rahman I. , 2004) • In September 2019, flash floods left thousands stranded (Rahman I. , 2004) • In August 2021, nearly 60,000 families in various districts and upazilas were waterlogged (Rahman I. , 2004)
Heat Waves	1989, 1992, 1995, 1997, 2005, 2006, 2007, 2010, 2011, 2012 , 2014, 2015 (ICLEI-Local Government for Sustainability, 2016) , 2016, 2019 (Subedi, 2022), 2021 (Tribune, 2021), 2022 (Sun, 2022)

Table- 2: *Climate projections and extreme weather impacts in Rajshahi city*
Source: IRADe, 2022

The above table illustrates that the city constantly faces heat waves and their extreme impacts. It is very difficult for the citizens to cope with this weather. The lack of resources and inadequate housing compromise the coping capacity of the city. From 1998 to 2011, there were 13 separate heat waves for these 23 years. In the heatwave of 2014, many people faced heat stress and its adverse impacts on the environment, including animals.

Most heat waves occur during the hot pre-monsoon summer season, between April and June, with most in May. During this period, acc. to the Rajshahi Medical College Hospital, there is an increase in heat-related diseases such as diarrhoea, jaundice, and viral fever increases, sunstroke, kidney ailments. In livestock, there is an increase in domestic animals suffering from diarrhoea, stroke, salivation, dysentery and dehydration due to extreme heat.

The extreme heat affects the livelihood and productivity, especially the outdoor workers such as day labourers, rickshaw and van pullers, construction workers, masons and street vendors.

Heatwave Management Practices

This factsheet shows a strong case for focusing on heat risk management and improving early warning systems for heatwaves. However, the Bangladesh Meteorological Department (BMD) does not have a definition of a heatwave; it does lay down a heatwave situation with a maximum temperature threshold of 36° C. This lack of clarity has cascading impacts on the heatwave management in Rajshahi city.

The policy landscape in Bangladesh has many policy frameworks relevant to addressing heat risks such as the climate change frameworks such as Bangladesh Climate Change Strategy and Action Plan 2009 (BCCSAP 2009); National Adaptation Plan (NAP); Bangladesh National Building Code of 2006; The Perspective Plan (Vision 2021); The Energy Efficiency and Conservation Master Plan (E&CC Master Plan). Each of these policies has tremendous potential to improve the impacts of heat stress in the city. However, a lot needs to be done to bring synergies with the impacts of the heatwave.

At the city level, efforts have been made to identify the heat hotspots, heat thresholds (CDKN, 2022) and Sector-specific vulnerability Assessments, including Climate Resilient City Action Plan (ICLEI, 2016). In addition, some measures such as mass plantation programmes called Zero Soil, which aims to cover all open spaces and pavements with plants, have been undertaken recently to address greenhouse gas emissions and rising temperatures. The RCC offered property tax waivers to residents who plant trees on their premises and build rooftop gardens. The citizens of Rajshahi have adopted informal adaptations largely based on the indigenous adaptation strategies for reducing heatwave impacts.

References

- Aid, W. (2019, , March 22). Retrieved from sfd.susana.org : <https://sfd.susana.org/about/worldwide-projects/city/151-rajshahi#>
- Habib, M., Ahmed, M., Aziz, M., Beg, M., & Hoque, M. (2021). Municipal Solid Waste Management and Waste-to-Energy Potential from Rajshahi City Corporation in Bangladesh. *MDPI*.
- Haque, A. K. (2017). *Solid Waste Management of Rajshahi City Corporation in Bangladesh: Policies and Practices*. Retrieved from https://www.researchgate.net/publication/346580176_Solid_Waste_Management_of_Rajshahi_City_Corporation_in_Bangladesh_Policies_and_Practices/citation/download
- Haque, A. (n.d.). *Transport Situation in Rajshahi, Rajshahi City Corporation*. Retrieved from <https://www.unescap.org/>: https://www.unescap.org/sites/default/files/2a.3_TransportSituation_Rajshahi_AshrafulHaque.pdf
- ICLEI-Local Government for Sustainability, S. A. (2016). *City resilience strategy, Rajshahi*. Rajshahi: ICLEI-Local Government for Sustainability, South Asia.
- Imran, M. A. (2015). *Case Study on the Solid Waste Management of Rajshahi City, an Idea to It' S Recycling & Probable Measures for Its Management*. Retrieved from <https://www.researchgate.net/>: https://www.researchgate.net/publication/306292653_Case_Study_on_the_Solid_Waste_Management_of_Rajshahi_City_an_Idea_to_It'_S_Recycling_Probable_Measures_for_Its_Management/citation/download
- Rahman, F. I. (2018, Vol. 3, Issue 2). Case Study on Transportation System in Rajshahi City, Bangladesh. *MAT Journals*, 1–10.
- Rahman, I. (2004, October 16). *Flash flood leaves thousands stranded in Rajshahi*. Retrieved from www.tbsnews.net : <https://www.tbsnews.net/bangladesh/flash-flood-leaves-thousands-stranded-rajshahi>
- Shamsuzzoha, M. P. (2015). Analysis of Variability in Rainfall Patterns in Greater Rajshahi Division using GIS. *Journal of Environmental Science and Natural Resources*, 7(2), 141–149.
- Subedi, A. I. (2022). *Identification of Heat Threshold and Heat Hotspots in Rajshahi, Bangladesh*. Rajshahi: Red Cross Red Crescent Climate Centre.
- Sun, D. (2022, August 18). Retrieved from <https://www.daily-sun.com/>: <https://www.daily-sun.com/post/638697/Bangladesh-reels-under-mild-heatwave>
- Tribune, D. (2021, May 17). *Met Office: Heat wave may continue for 4/5 more days*. Retrieved from <https://archive.dhakatribune.com/>:

<https://archive.dhakatribune.com/bangladesh/2021/05/17/bmd-heat-wave-may-continue-for-4-5-more-days>

Uddin, S. H. (2011). Water supply and sanitation system in Rajshahi City, Bangladesh. *International Household Survey Network, Vol. 6, Issue 1.*

Ullah, M. &. (2013). *A study on some aspects of drainage system in Rajshahi city, Bangladesh.*
Retrieved from [https://www.researchgate.net/:
https://www.researchgate.net/publication/341161851_A_study_on_some_aspects_of_drainage_system_in_Rajshahi_city_Bangladesh](https://www.researchgate.net/publication/341161851_A_study_on_some_aspects_of_drainage_system_in_Rajshahi_city_Bangladesh)