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Implementation of the United for Smart Sustainable Cities Initiative

Smart Sustainable Cities Profile: Bishkek, Kyrgyzstan

Note by the Committee Bureau

Summary

This note contains the Smart Sustainable Cities Profile for the city of Bishkek, Kyrgyzstan.

The Committee is invited to welcome the city profile and approve it as an official publication in English and Russian, digital and print.

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Executive Summary

Bishkek is the capital and central socio-economic, political and cultural hub of the Kyrgyz Republic. The city has a population of over 1 million inhabitants - over 15 per cent of the country's population. Since gaining independence from the Soviet Union in 1991, Bishkek has been undergoing rapid urban development contributing a large share to the country's rural to urban migration. In the last 20 years, the city grew by over 250,000 people. While the city's overall economic situation improved in recent years, urban planning lagged. Furthermore, political instability¹ negatively affected the ability of institutions to design and implement long-term and integrated urban policy, as well as the city's ability to attract investment.

Today, urban decision makers in Bishkek face multiple challenges, ranging from enhancing the city's ability to respond to urban challenges such as rapid population growth, continued expansion of informal settlements, deterioration of the environment and impacts to human health, and a stagnating local budget. With 400,000 people forecasted to move to Bishkek over the next 15 years, urban decision makers are at an urban development crossroad to either step up the delivery of inclusive and sustainable infrastructure and seize the benefits of urbanization or face increasing economic, social and environmental costs.

The COVID-19 pandemic and ensuing economic recession impacted all sectors, putting a spotlight on some longstanding social and economic challenges in Bishkek. Nevertheless, Bishkek has a high potential to turn urban social and economic challenges into sustainable development opportunities. To support Bishkek in advancing towards a more sustainable, inclusive and resilient urban growth, UNECE carried out an evaluation of the city's performance against the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC).

This paper is published at a critical time since Bishkek is currently designing a new master plan from 2025. The outcomes of the evaluation, supported by a review of the documentary data sources, interviews and feedback sessions with local experts provided the basis for the recommendations to:

- 1. Strengthen the linkage between urban policy design and infrastructure financing and implementation.**
 - a. Improve institutional and governance frameworks towards integrated and long-term urban planning.
 - b. Develop a socio-economic development programme for 2022-2024 and explore innovative financing mechanisms for basic and social infrastructure delivery.
 - c. Develop a city-level repository for disaggregated urban level data.
 - d. Improve methodologies and standards for collecting and managing urban data.
- 2. Legalize, upgrade and redevelop informal settlements.**
 - a. Develop an inventory of all land plots and create a unified registry of all informal settlements.
 - b. Amend key planning regulations to improve formalization procedures.
 - c. Upgrade informal settlements through an integrated and participatory approach to basic and social infrastructure delivery.
 - d. Design a socially just coal phase out.
 - e. Identify residential homes located in unsafe areas and begin relocation procedures.
- 3. Develop a formal affordable housing programme following compact urban development.**
 - a. Develop an affordable housing programme, both for housing for sale and for rent, that is realistically achievable for those on low- and middle-income levels.
 - b. Pursue compact urban development by incentivizing the development, redevelopment, and infill of underused or vacant land plots.

¹ Political instability has been underpinned by three revolutions which deposed presidents in 2005, 2010 and 2020.

4. Develop sustainable urban transport infrastructure.

- a. Invest in low-carbon public transport infrastructure.
- b. Expand sharing mobility options.

5. Improve internet access and digital literacy.

- a. Provide reliable internet access to all households.
- b. Improve digital literacy.

6. Improve the water and sanitation infrastructure.

- a. Deliver water and sanitation infrastructure to informal settlements.
- b. Improve the lifespan of the existing water and sanitation infrastructure by investing in its renovation.

7. Improve solid waste management.

- a. Increase the volume of waste recycled and decrease the amount of waste put into open-air dumps, incinerated, burned, or disposed of into landfills.
- b. Promote solutions that allow for the integration of waste management into water and energy management.

General overview

Known as Frunze during the Soviet Union, the city was renamed as Bishkek after the Kyrgyz Republic gained independence in 1991. Bishkek is the administrative centre of the Chuy Province and is sub-divided into 4 administrative districts: Oktyabrsky, Pervomaysky, Sverdlovsky and Leninsky. The administration and day-to-day management of the city is the responsibility of the Bishkek City Hall.

Bishkek is in the north of Kyrgyzstan at 800 metres of altitude and about 40 kilometres (km) from the northern ridge of the Ala-Too mountains. It is also relatively close (180 km) to Issyk-Kul, the seventh deepest lake in the world and the country's most popular vacation resort. The city has a continental climate with average temperatures between 25°C and -2°C. Two main rivers, Alaarcha and Alamedin, flow through the city connecting at the Great Chuy Canal.

Bishkek is 25 km away from the border of Kazakhstan and is connected to other major cities of Central Asia and the Russian Federation through the Turkestan-Siberian Railway and to China via land routes. In recent years, Bishkek has been strengthening international cooperation through, inter alia, membership with international organizations, partnerships and projects such as the International Assembly of Capitals and Cities, the United Nations Development Account (UNDA) 12th and 13th tranche projects² and the European Bank for Reconstruction and Development's (EBRD) Green Cities programme³.

Bishkek is the testing ground for the majority of the Government's pilot projects as part of the National Development Strategy of the Kyrgyz Republic for 2018-2040, most notably the "School of the Future", "Safe City" and "Healthy City", which aim to address some of the country's longstanding challenges in the education, transportation and health care sectors.

Building on a highly entrepreneurial society, Bishkek has a high potential to further strengthen its economic potential. Around 60 per cent of the country's small and medium enterprises (SMEs) and 18 per cent of the national industrial production are concentrated in the capital city. Bishkek is the country's major financial centre as well as the national cultural centre. As the latter, Bishkek has a wide range of cultural infrastructure, including

² UNECE, *UNDA 12th tranche project on innovative financing for sustainable smart cities, January 2020-March 2023*. Available at: <https://unece.org/housing/innovativefinancing-sustainablemartcities>; <https://unece.org/housing/urban-resilience-after-covid19>.

³ EBRD Green Cities, *Bishkek*. Available at: <https://ebrdgreencities.com/our-cities/bishkek/>

the Kyrgyz National Philharmonic Hall, the National Opera and Ballet Theatre, drama theatres, libraries and museums. Bishkek is also a popular international tourism destination, offering many attractions such as galleries, parks, squares and restaurants primarily in the centre of the city.

Rapid urban development and informal settlements

Over the last three decades, Bishkek underwent rapid urban development. Since 1989, the city's population has nearly doubled and is now well over 1 million⁴. The urbanization process was largely driven by the influx of rural migrants who, following the dissolution of the Soviet Union, pursued improved economic opportunities in the country's major urban economic centre⁵. Population growth picked up pace in recent years as economic situation started to improve (see figure 1). Since 2000, the city has grown by approximately 250,000 people (see figure 2).

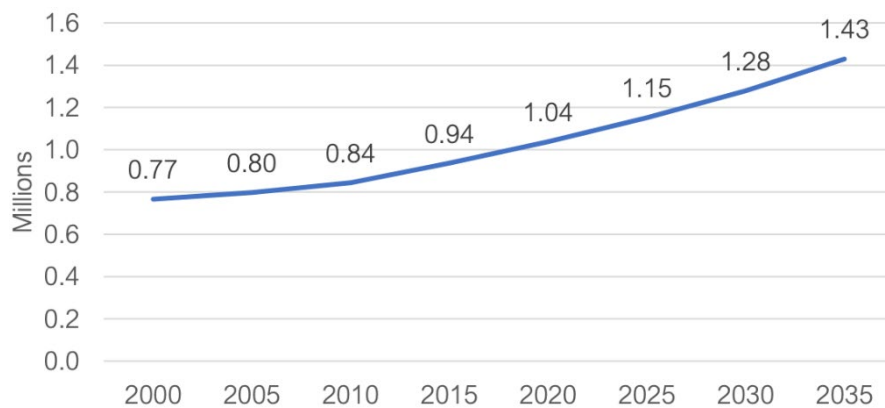


Figure 1: Population of Bishkek 2000-2035.

Note: Economic and Social Commission for Asia and the Pacific (2020).

⁴ National Statistical Committee of the Kyrgyz Republic, *Population*. Available at: <http://stat.kg/en/statistics/naselenie/>

⁵ Food and Agricultural Organization of the United Nations (FAO), *Background to Kyrgyzstan*. Available at: <http://www.fao.org/3/j2603e/j2603e04.htm>

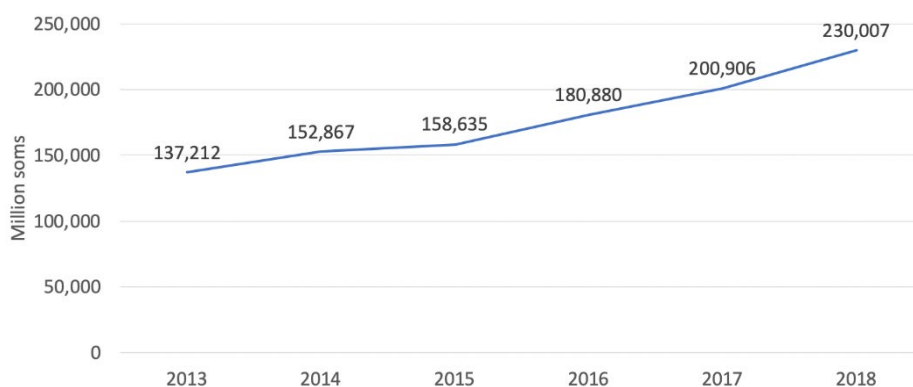


Figure 2: Bishkek Gross Regional Product (GRP) at 2020 prices.

Note: Economic and Social Commission for Asia and the Pacific (2020).

As part of the overall transition towards a market economy, the Kyrgyz Republic implemented a major restructuring of its housing and land policy at the beginning of the 1990s. Some of the reforms undertaken were the de facto withdrawal from direct housing provision and decentralization of housing regulation functions to local governments, which resulted in 90 per cent private housing by 1994⁶. To accommodate the housing needs of young workers, many of them rural migrants, the land policy of Bishkek considered the allocation of 600 square metres (m²) of land to each urban dweller⁷. This approach to land policy, coupled with widespread political and socio-economic unrest at a time of high urbanization, favoured the development of illegal informal settlements in the outskirts of the city. Political unrest and the lack of a clear position from the State, especially after the 2005 Tulip Revolution, incentivized many people to skip lengthy and rigid official procedures and misappropriate public land⁸.

Although the city's overall urban economic outlook significantly improved over the past decade (see figure 2), urban planning lagged and basic and social infrastructure development did not keep pace with population growth, especially in informal settlements. Today, the continued expansion of informal settlements constitutes one of the city's major challenges. According to estimates shared by the city government, between 18 and 25 per cent of the inhabitants live in 47 informal settlements in the outskirts of Bishkek⁹. The exact number of informal settlement residents remains unknown because most residents of these settlements are not officially registered with the city and do not carry official identification such as birth certificates and IDs. However, a recent study suggests that the number of informal settlements in Bishkek may have already grown to 53 with the number of people living in them accounting for about 30 per cent of the city's population Urgent action

⁶ UNECE Country Profiles on the Housing Sector, *Kyrgyzstan 2010*. Available at: <https://unece.org/DAM/hlm/documents/Publications/cp.kyrgyzstan.e.pdf>.

⁷ UNECE Post COVID-19 Recovery Action Plan for Informal Settlements in the UNECE Region, *Online Kyrgyzstan Local Stakeholder Workshop 10 December 2020*. Available at: <https://unece.org/info/Housing-and-Land-Management/events/349352>.

⁸ UNECE, Post COVID-19 Recovery Action Plan for Informal Settlements in the UNECE Region, *Report on the Assessment of Informal Settlements in Bishkek, General Conclusions and Recommendation, 10 December 2020*. Available at: <https://unece.org/sites/default/files/2020-12/NAbdyrasulova%20Bishkek%20Draft%20Assessment%20Report%20E2%80%93%20Key%20Findings%2010%20Dec.pdf>

⁹ UNECE, *UNECE and the City of Bishkek will work together to solve the problem of informal settlements, 17 March 2020*. Available at: https://unece.org/housing-and-land-management/news/unece-and-city-bishkek-will-work-together-solve-problem-informal?fbclid=IwAR0thgT-23eelsCRNcjtjdXsLrLFKLkwTXqVOBFh_tgb6_iZQxT1Lz7JFs.

concerning the legalization, upgrading and redevelopment of informal settlements is needed given that the population of Bishkek is projected to increase to as many as 400,000 more over the next 15 years¹⁰.

Informal settlements represent a major social, economic, environmental and health challenge for the city and its residents, especially for the residents of the settlements themselves. Lacking official registration, inhabitants of informal settlements face major issues in their access to key infrastructure services such as centralized electricity, water and sanitation, and basic urban services such as education, formal employment, health care and social protection, among others.

Living conditions and incomes vary greatly across informal settlements in Bishkek. Older settlements, established in the late 1980s and early 1990s, generally enjoy greater access to infrastructure services. In principle, this is explained by their more “formal” condition and better compliance with legal procedures¹¹. The official number of legally registered households in older informal settlements is still low; however, a survey-based study showed a wide discrepancy between official numbers and those reported by residents as registered or what they perceive to be registered.¹² While reliable data on this is scarce, informal settlements established in the early 2000s and following the Tulip Revolution enjoy lower rates of formality, which impacts access to infrastructure and services.¹³

¹⁰ ESCAP, *Forecasting Sustainable Urbanization, Support for Sustainable Infrastructure Planning in cities: Inception and Data Collection Workshop Report, 20-21 February 2020*. Available at:

https://www.unescap.org/sites/default/files/Forecasting_Workshop%20Report_Bishkek.pdf

¹¹ International Journal of Law in the Built Environment, *Illegal Geographies of the State: The Legalization of a “Squatter” Settlement in Bishkek, Kyrgyzstan, April 2015*. Available at:

https://www.researchgate.net/publication/276901352_Illegal_geographies_of_the_state_The_legalisation_of_a_squatter_settlement_in_Bishkek_Kyrgyzstan.

¹² World Bank, *Urban Novostroiki Settlements in Bishkek, Kyrgyz Republic, Issues and Options, April 2007*. Available at:

<https://openknowledge.worldbank.org/bitstream/handle/10986/26064/111646-WP-PUBLIC-URBAN-NOVOSTROIKI-SETTLEMENTS.pdf?sequence=1&isAllowed=y>.

¹³ Ibid.

The Ak-Bosogo informal settlement, established at the end of the 1980s, forms part of the older generation of informal settlements in Bishkek. Ak-Bosogo has a population between 20,000 and 30,000 people and an average household size of 5.1. UNECE-led research from late 2020 (see box 1) shows that only 11 per cent of local residents followed proper housing construction regulation. As a result, only 31 per cent of the inhabitants has access to a toilet or bathroom. Key services schools, kindergartens, public spaces, roads, shopping areas and others are also significantly underdeveloped¹⁴. Findings from the same research show that the in Kalys-Ordo informal settlement, located in the north of Bishkek and established around 2003, 89 per cent of residents are not registered with the city administration.

Box 1: “Post-COVID-19 Recovery in Informal Settlements in the ECE Region” project in Bishkek | September to December 2020

The COVID-19 pandemic posed challenges specific to informal settlements. Recognizing the urgency to address these challenges, UNECE carried out a project aimed at strengthening the capacity of national and local governments to address the needs of the most vulnerable population groups living in informal settlements. The project was implemented between September and December 2020 in the cities of Bishkek (Kyrgyzstan), Tirana (Albania), Podgorica (Montenegro) and Skopje (North Macedonia).

In Bishkek, local experts analysed five informal settlements- Archa-Beshik, Ak-Bosogo, Kalys-Ordo, Kalys-Ordo and Rukhiy-Muras - focusing on their key legal, socio-economic and environmental issues. The assessment identified key basic and social infrastructure challenges, as well as gaps and barriers for the formalization of occupied land plots.

The project provided concrete recommendations to enhance the integration of informal settlements into the urban fabric and helped Bishkek include informal settlements into socio-economic recovery strategies. The project is also expected to have helped increase capacities of national and local governments in transforming informal settlements into sustainable, resilient urban areas to better withstand future shocks.

Legal and institutional framework for urban development

The status of Bishkek as the administrative, economic and cultural centre of the country is enshrined under the 2013 Kyrgyz Law “On status of the Capital”.¹⁵ This law defines the institutional and administrative framework of the city’s governance, assigning duties and responsibilities within the elected representative body - the Bishkek City Kenesh (Council) - and the executive body - the Mayor’s Office. The Mayor’s office is controlled by and accountable to the Council, consisting of 45 deputies elected for a 4-year term.¹⁶ The most recent elections for the Bishkek City Kenesh were held in April 2021.

The city’s day-to-day management is the responsibility of the Mayor’s Office, which is further sub-divided into three core structures: i) municipal administration centres for each of the city’ districts (4 centres), ii) sectoral departments (17 departments), and iii) municipal enterprises (18 enterprises).¹⁷ The municipal administration centres coordinate the delivery of services to the population in each of the four districts. Sectoral departments which include Economics and Investments, Health, Urban Transport, Culture, Education, Land Resources, Capital Construction, are responsible for city-wide strategic planning. The municipal enterprises are responsible for the on-the-ground delivery of specific public services including electricity, waste management and road repairs.¹⁸

The Land Resources Department of Bishkek manages land leases and acquisitions. The Department of Land Use and Construction is responsible for the control over municipal land and buildings while the Capital Construction Department supervises capital repairs. The Department of Urban Development and Architecture coordinates

¹⁴ UNECE, *Post COVID-19 in Recovery in Informal Settlements in the UNECE Region: Report on Post-COVID-19 recovery in informal settlements of Bishkek City, 2020-2021* (unpublished).

¹⁵ Ministry of Justice of the Kyrgyz Republic, *Law of the Kyrgyz Republic, About the Status of the Capital, 12 December 2013*. Available at: <http://cbd.minjust.gov.kg/act/view/ru-ru/205092>.

¹⁶ Ministry of Justice of the Kyrgyz Republic, *Law of the Kyrgyz Republic, About Local Self-Government, 15 July 2011*. Available at <http://cbd.minjust.gov.kg/act/view/ru-ru/203102>.

¹⁷ Bishkek City Hall, *Bishkek City Hall Structure*. Available at: <https://www.meria.kg/ru/structurebishkek>.

¹⁸ Ibid.

the strategic alignment of all urban development-related activities in the city, as well as the implementation of the government's unified territorial development policy.¹⁹

The city's Health Department controls compliance with norms for landscaping, as well as sanitary and environmental standards. It also oversees the public enterprises responsible for waste management. Bishkek has several units responsible for the social and cultural sector, including the Cultural Directorate, Education Office, Social Development Administration, Department of Culture and other regulatory administrative bodies. All of them are part of the Mayor's Office and are overseen by its Central Apparatus.²⁰ The Central Apparatus is a central body within the Mayor's office and acts as a cabinet for the Mayor coordinating all activities relevant to the Mayor's office²¹.

The territorial development policy of Bishkek is guided by its master plan. The current master plan, developed in 2010 with validity up to 2025, outlines the city's current and projected spatial development structure. This document envisions the urban footprint to grow from 170 km² to about 259 km² and to reach a population of 1.2 million inhabitants by 2025. The rapid expansion of the city's urban footprint is linked to a key provision outlined in the 1999 Land Code of the Kyrgyz Republic. The Land Code establishes that every citizen is entitled to a land plot free of charge provided that they develop a residential building or holiday home or use it for agricultural purposes. Although the current master plan of Bishkek is valid until 2025, the development of a new one has already started in 2019.

The increasingly high concentration and positive contribution to the country's economic output of small and medium enterprises (SMEs) in Bishkek led the Government to adopt several laws, as well as to create institutions to protect the rights of business owners and provide additional incentives for opening new businesses. These include the laws "On state support of small business", "On the protection of the rights of entrepreneurs", and "On public-private partnership in the Kyrgyz Republic". Additionally, in 2018, with support from the European Bank for Reconstruction and Development (EBRD), the Government established the Business Ombudsman Institute, a unit authorized to protect the rights, freedoms and legitimate interests of business entities.²² Furthermore, in 2020, the Government founded the Investment Council under the Mayor's Office for defining the main investment priorities of the city. The tasks of the Investment Council are guided by the Investment Policy for Development of Bishkek for the period of 2020-2023.

¹⁹ Bishkek City Hall, *Department of Urban Planning and Architecture of Bishkek City Hall*. Available at: <https://www.meria.kg/ru/structures/division/24>.

²⁰ Bishkek City Hall, *Social department*. Available at: <https://www.meria.kg/ru/apparat/15>.

²¹ Bishkek City Hall, *Bishkek City Hall structure*. Available at: <https://www.meria.kg/ru/structurebishkek>.

²² Business Ombudsman Institute, *Mission*. Available at: <https://boi.kg/normative-base>.

Box 2: Geo-spatial data project | Norwegian Mapping Authority and Kyrgyz State Agency on Land Resources | 2017 - 2021

The lack of reliable and up-to-date geospatial data is a key challenge for Kyrgyzstan to meet the SDGs. Since 2013, the Norwegian Mapping Authority has been significantly engaged with capacity development projects in Kyrgyzstan. The current geo-spatial data project is financed by the Norwegian Ministry of Foreign Affairs.

Goals:

- To support efficient, secure and transparent real estate registration, providing access to geospatial information to all interested users and improving public services.
- To enable cooperating partners – the State Agency on Land Resources and National Statistics Committee - to support planning, monitoring and reporting on the implementation of the SDGs.
- To support national population and building/construction censuses and all types of elections, with geospatial data.
- To support the implementation of the Group of Experts on Global Geospatial Information Management (UN GGIM) Integrated Geospatial Information Framework (IGIF) in Kyrgyzstan.
- To cooperate with Statistics Norway, the National Statistics Committee of Kyrgyzstan, the Municipality of Bishkek, the World Bank Water Management project, and a GIZ-funded project on climate change mitigation.

Achievements:

- Delivered digital aerial imagery and terrain model for selected areas of the country with most economic interest: Bishkek, Chuy region, Fergana valley, Issyk-Kul – approximately 22,000 km².
- Developed a web-portal (kyrgyzmap.kg) with available spatial data.
- Delivered a wide-format scanner and software for the digitalization of paper maps.
- Delivered unmanned aerial vehicles (UAVs) for small-area photography and mapping.
- Extended and upgraded the Geographic Positioning Network.
- Digitized and georeferenced maps for property registration and cadastre.
- Supplied local registration offices with professional equipment for cadastral surveying to support massive privatization programmes.
- Supplied the agency with new server and network equipment for storage and distribution of geospatial data.
- Supplied the geodetic institute with digital photogrammetric stations and professional software for map production.

Currently, the project is working on the development of the country's National Spatial Development Infrastructure (NSDI) profile, geospatial alignment to policy drivers and NSDI action plan.

Funding and financing framework for urban development

The 2020 city budget was KGS 10.2 billion (around USD 120 million),²³ which was 20 per cent more than the previous year. However, the budget forecasted for 2021 and 2022 remain virtually unchanged and amount to between KGS 10.1 and KGS 10.5 billion (between USD 119 and USD 124 million). While there was a consistent increase in the city's municipal revenues over the last five years²⁴, the size of the budget is inadequate to deliver the infrastructure and service needs of the city.

Local tax revenue constitutes a large portion of the Bishkek budget (88 per cent in 2019)²⁵. The budget is allocated among the four administrative districts and a big slice goes to the general budget of the city. In 2020, 52 per cent of the budget went to the city's general budget²⁶. The city communicates its budget priorities and spending in a transparent manner through the "Bishkek City Information Portal"²⁷. In this portal residents can find information about the current municipal account balance, its municipal debt, and recent purchases.

In the coming years, the city administration plans to increase the inflow of revenue to the local budget from both tax and non-tax sources by ensuring that: (i) all businesses are reporting accurate sales figures and using cash registers; (ii) identifying the owners of unregistered properties; (iii) carrying out oversight activities to detect unauthorized development of land plots; and (iv) taking an inventory of municipal property in order to lease out unused fixed assets.

To meet the funding requirements of its urban development projects, Bishkek collaborates with different private sector organizations. For example, a Swiss private company was chosen to assist in the implementation of the "Electronic Ticketing on Public Transport" project, following a competitive bidding process authorized by the Bishkek City Mayor's Office. The company offered a low transaction price, 20,000 free electronic cards for certain population demographics, and the option to top up the electronic cards using bank cards.

The deep economic impacts of the COVID-19 pandemic reinforced the need for the creation of innovative mechanisms for municipal financing. For instance, city officials envision the establishment of a dedicated development fund for supporting start-ups and SMEs to create new, quality jobs. Currently, however, the city does not have adequate policy tools to implement structural economic and financial measures needed to support businesses and develop basic and social infrastructure at the required pace. In this context, city officials believe that national regulation, such as the Budget Code, needs to be amended and allow the city to design and implement financial mechanism in line with the market economy²⁸.

City officials are also encouraged to identify viable funding sources and apply for technical assistance for project preparation support. Especially in developing cities such as Bishkek, project preparation support is a key factor to successful infrastructure planning and delivery. It has been estimated that in developing cities, technical assistance for project structuring and delivery planning can amount to as much as 10 per cent of the overall project cost²⁹.

²³ Bishkek City Council, *Kyrgyzstan, Resolution on Approval of the Budget of Bishkek City for 2020 and forecast for 2021-2022*. Available at: <http://www.gorkenesh.kg/ru/the-rulings-of-the-bgk/27-sozyv/4290-n125-on-the-approval-of-the-bishkek-city-budget-for-2020-and-the-forecast-for-2021-2022.html>

²⁴ Bishkek City Hall, *Note on Bishkek Budget, 2019*. Available at: <https://www.meria.kg/assets/img/Grajdanski2019.pdf>.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Bishkek City Hall, *Information portal of Bishkek*. Available at: <https://monitoring.meria.kg/>

²⁸ UNECE, *Towards a Smart Sustainable City and Post-COVID-19 recovery Online workshop Bishkek 10 March 2021*. Available at: <https://unece.org/housing/events/bishkek-workshop-sustainable-smart-city>

²⁹ Global Infrastructure Hub, *Project preparation—financing project preparation: how can governments effectively utilise project preparation financing sources? 19 March 2019*. Available at: <https://www.gihub.org/blog/financing-project-preparation-governments-effectively-utilise-financing/>

Evaluation of Bishkek against the Key Performance Indicators for Smart Sustainable Cities

To support the commitment to build a smart and sustainable Bishkek, UNECE carried out an evaluation of the performance of Bishkek against the KPIs for SSC in 2019 and 2020. The KPIs for SSC are a United Nations standard developed by UNECE and ITU in 2015.

The KPIs for SSC have been tested and implemented globally in over 150 cities including 17 Norwegian cities, Grodno (Belarus), Tbilisi (Georgia), Tirana (Albania), Podgorica (Montenegro), Almaty (Kazakhstan), and Nur-Sultan (Kazakhstan).

The KPIs for SSC consist of 91 indicators at the intersection of three dimensions of sustainability (economy, environment, and society and culture) and information and communication technologies (ICTs). The KPIs are outlined in the publication *Collection Methodology for Key Performance Indicators for Smart Sustainable Cities*. The evaluation of Bishkek was supported by the *Protocol on the Evaluation of City Performance against the Key Performance Indicators for Smart Sustainable Cities*.

The graph below visualizes the performance of Bishkek against the KPIs for SSC. The performance of Bishkek in relation to the three dimensions of the KPIs and relevant city actions is discussed in detail, with a view to identifying the challenges to, and opportunities for making it smarter and more sustainable.

The study suffers from limitations due to lack of data on the domains of the KPIs for SSC methodology. Bishkek reported 72 out of 91 but indicators. More specifically, 31 out of 50 economy indicators were reported, 16 out of 28 environment indicators were reported, and 26 out of 29 society and culture indicators were reported. Improving sustainable development depends on the access to and availability of urban data.

Bishkek is, therefore, encouraged to collect urban data on the following areas of the economy dimension:

- **Electricity supply:** Demand response penetration; Electricity supply ICT monitoring
- **Transport:** Traffic monitoring; Public transport network access; Percentage of people using private vehicles; Percentage of people using public transport; Percentage of people walking; Percentage of people cycling; Percentage of people using para transport; Travel time index; Number of shared bicycles; Number of shared vehicles.
- **Public sector:** Open data, e-Government, Public sector e-procurement.
- **Buildings:** Public building sustainability; Integrated building management systems in public buildings.
- **Infrastructure:** Pedestrian infrastructure; Urban development and spatial planning.

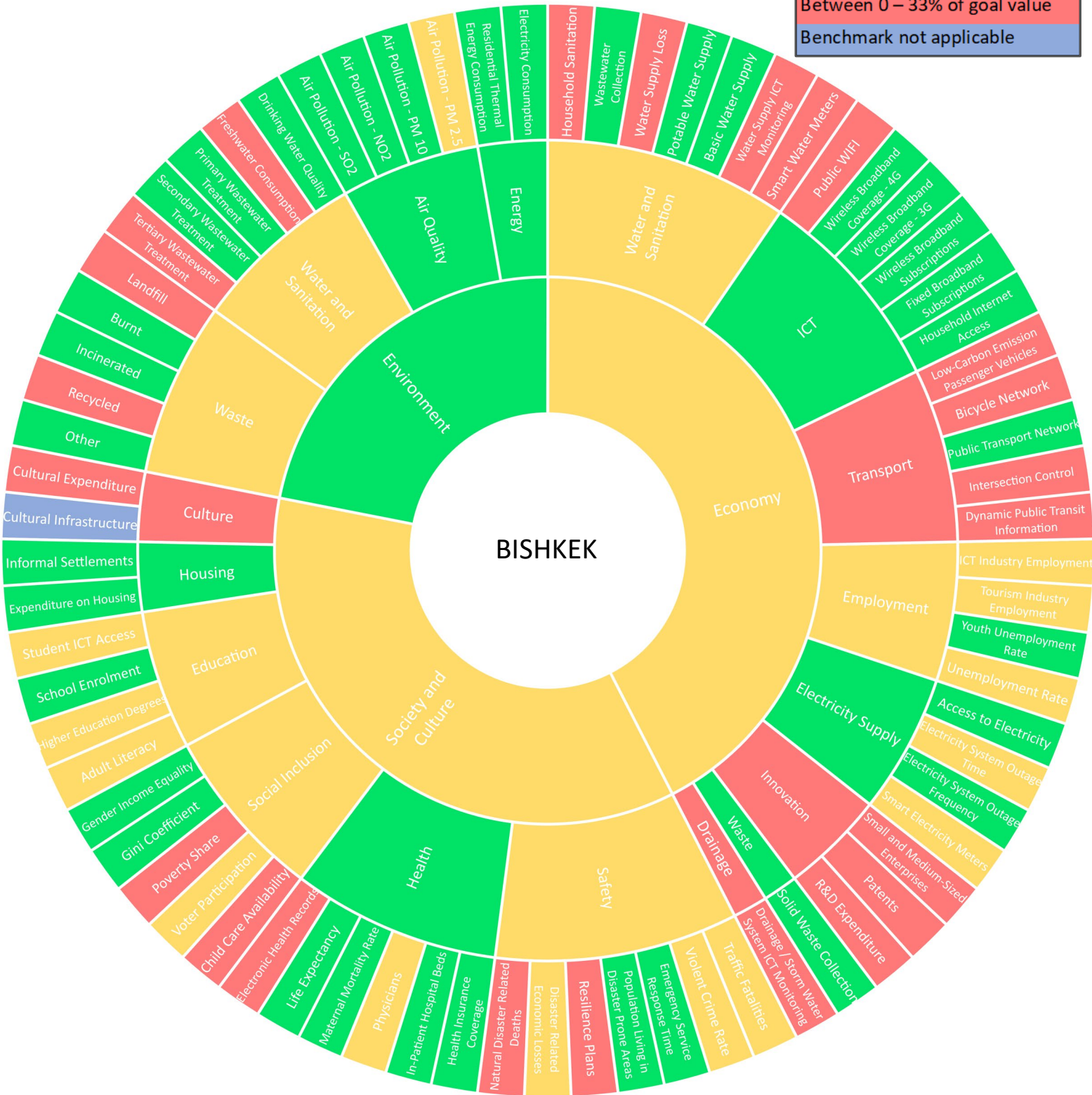
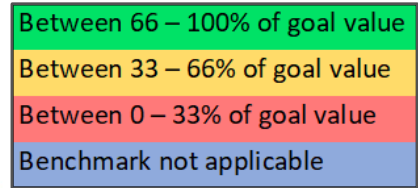
Bishkek is also encouraged to supply urban data on the following areas of the environment dimension:

- **Air quality:** Quantity of ozone (O3) in the air; Greenhouse gas (GHG) emissions per capita.
- **Water and sanitation:** Water consumption per capita.
- **Waste:** Amount of waste disposed into open dumps.
- **Environmental quality:** Electromagnetic field (EMF) exposure; Noise exposure.
- **Public space and nature:** Green areas; Green area accessibility; Protected natural areas; Recreational facilities.
- **Energy:** Renewable energy consumption; Public building energy consumption.

Lastly, Bishkek is encouraged to supply urban data on the following areas of the society and culture dimension:

- **Safety:** Number of police officers; number of firefighters.
- **Food security:** Local food production

Graph 1 - The performance of Bishkek against the KPIs for SSC.



Economy – an overview

As the capital and major socio-economic and financial centre of the country, the economic development of Bishkek is deeply linked to national government strategies and concepts that outline the priorities and the vision of the country's future.

The National Development Strategy of the Kyrgyz Republic for 2018-2040 is the overarching document outlining the vision and practical steps for the development of the country's major cities and regions. For Bishkek, this document envisions the modernization of the healthcare infrastructure, the creation of additional recreational areas, and the construction of modern schools and social assistance centres. Moreover, it specifically mentions launching several projects to achieve these results including the "Healthy City", "School of the Future", and "Safe City" projects to address challenges in healthcare, education and transportation sectors.

The National Strategy is supported by medium-term policy documents, such as the Social and Economic Development Program for 2021-2023 and the Regional Policy Concept for 2018-2022.³⁰ The Development Programme establishes the infrastructure priorities for the next years, inter alia the modernization of the Bishkek CHP Power Plant and the reconstruction of Bishkek-Osh and Bishkek-Naryn-Torugart road connections. The Regional Policy Concept outlines the country's main economic challenges, emphasizing the need to focus on the development of the economically underdeveloped southern region. In this context, the Regional Policy Concept document plans to position Bishkek as one of the logistical and financial centres of Central Asia, provided that the service infrastructure is upgraded to modern international standards.

One of the country's priorities is the digitalization of public services and the promotion of e-governance, which is outlined in the National Concept for Digital Kyrgyzstan 2019-2023³¹. Development pillars include increasing the digital literacy of schoolchildren and teachers, as well as improving information technology capacities of schools. To achieve such improvements in the education sector, the Government is implementing the "Smart School" programme that is being piloted in 10 schools in the cities of Bishkek and Osh and in each oblast of the country. However, the COVID-19 pandemic showed that much remains to be done in digitalizing key sectors such as education³².

Kyrgyzstan is making progress in digitalizing public services through its Centre for Electronic Interaction "Tunduk". The Centre was established with the assistance of the Government of Estonia and has become the country's primary mechanism for improving cross-sectoral coordination among state bodies.

Over the last few years, Bishkek has been improving the quality of its transport infrastructure, including roads and streets. For instance, the city implemented the project "Development of the Bishkek Street and Road Network", under which 49 road sections and 60 streets have been reconstructed and renovated.³³ Within the framework of the project, the "Bishkek City Road Surface Rehabilitation"³⁴ project restored the surface of 23 streets and with the "Bishkek City Public Transport Development Project", the city has obtained 132 new trolleybuses.

Additionally, Bishkek is implementing the project "Electronic Ticketing in Public Transport" utilizing public-private partnership (PPP). The project aims to introduce an electronic, cashless system for public transport by

³⁰ Ministry of Justice of the Kyrgyz Republic, *Concept regional policy of the Kyrgyz Republic for the period 2018-2022*, 31 March 2017. Available at: <http://cbd.minjust.gov.kg/act/view/ru-ru/99907>.

³¹ Ministry of Digital Development of the Kyrgyz Republic, *The Concept of Digital Transformation "Digital Kyrgyzstan" 2019-2023*. Available at: <http://ict.gov.kg/index.php?r=site%2Fsanarip&cid=27>.

³² Ibid, pp. 17.

³³ Bishkek City Hall, *Press Release: The second phase of the project "Development of the road network in the city of Bishkek"*, 2019. Available at: <https://www.meria.kg/ru/post/18404>.

³⁴ Bishkek City Hall, *Press Release: The presentation of the project "Restoration of the road surface of highways" took place in the capital, May 2018*. Available at: <https://www.meria.kg/ru/post/17022>.

using electronic cards. Moreover, the city is increasing the monthly wages of municipal transport employees from KGS 14,000 to KGS 29,000 (from USD 165 to USD 342).³⁵

Economy dimension – KPI evaluation results

Bishkek reported data on 31 out of 50 indicators for the economy dimension. The 19 indicators where data was not reported were mainly in the following areas: electricity supply; transport; public Sector; buildings; and infrastructure. The specific indicators not reported were: Demand response penetration; Electricity supply ICT monitoring; Traffic monitoring; Public transport network access; Percentage of people using private vehicles; Percentage of people using public transport percentage of people walking; Percentage of people cycling; Percentage of people using para transport; Travel time index; Number of shared bicycles; Number of shared vehicles; Open data; e-Government; Public sector e-procurement; Public building sustainability; Integrated building management systems in public buildings; Pedestrian infrastructure; Urban development and spatial planning.

ICT infrastructure

The data provided suggests that a large percentage of households has access to internet. There are 85,651 wireless broadband subscriptions per 100,000 inhabitants, and 42 per cent of households have a fixed (wired) broadband connection. Bishkek also showcases a high connectivity in 3G and 4G wireless broadband internet that covers the whole city. However, the city does not provide public Wi-Fi hotspots.

Access to electricity supply

All households have access to electricity with an average of 0.42 interruptions per year. These interruptions last 172 minutes on average, which is higher than the European Union (EU), where the estimate is of 84 minutes on average.

Prevalence of ICT monitoring systems

Only 47 per cent of electricity metres installed correspond to the definition of smart metres that allow for a direct real-time monitoring of electricity consumptions. Similarly, Bishkek does not have smart water metres that monitor the water consumption of citizens. The drainage and storm water system is also not monitored by the ICT. Only 13 per cent of the traffic lights on road intersections use adaptive traffic control or prioritization measures.

Water and sanitation

There are 84 per cent Bishkek households who have access to a basic water supply and an equal share have access to a safely managed potable water. The amount of water lost in the process of water distribution is estimated at 22 per cent. Approximately 71 per cent of households are served by wastewater collection facilities but only 29 per cent have access to sanitation facilities. There are also very few low-carbon-emission passenger vehicles in the city – only 0.4 per cent of all vehicles. There are no urban transport stops in Bishkek with dynamically available transit information.

Unemployment rate

The unemployment rate in Bishkek stands at 6.7 per cent. For the youth population however, the unemployment rate is much higher at 16 per cent and yet this is only slightly higher than the EU average of 15 per cent for 2019. Around, 1.2 per cent of the city labour force works in the tourism industry, while 1.3 per cent works in the ICT sector. The data reported through the KPI evaluation reveals that the city does not allocate funding for research and innovation. In this context, only 7.7 new patents are granted per 100,000 inhabitants per year compared to the European average of 48 for the same indicator.

³⁵ Bishkek City Hall, *Press Release: Electronic ticketing in Bishkek today about transport cards, 2020*. Available at: <https://www.meria.kg/ru/post/19168>.

Environment – an overview

In January 2021, the Government adopted a strategy - “Plan of Comprehensive Measures”- aimed at improving the environmental situation in Bishkek and other regions of the Chuy Oblast.³⁶ The plan details 40 actions for urban planning and design, heating, transportation, and air pollution monitoring, as well as the target indicators and responsible implementing agencies. These actions include reconstruction of irrigation network, increasing the size of green spaces, and development of bike lanes and sidewalks. The Plan also includes a number of measures to address air pollution, such as the gradual transition from coal to gas in city’s residential settlements, private businesses, and developing support mechanism for incentivizing usage of gas in the transportation sector.

Many international observers and development agencies have acknowledged the problem of Bishkek with air pollution and high concentration of harmful particulate matter (PM) – PM 2.5.³⁷ The Kyrgyz Ministry of Health estimates that 80 per cent of respiratory diseases can be attributed to air pollution. An international air monitoring services classified the air quality of Bishkek as “very unhealthy” in December 2020, with recorded PM 2.5 concentration as high as 184 µg/m³.³⁸ To address this issue, city officials are adopting measures to move away from coal-based heating energy supply. In 2020, the Mayor’s Office launched an initiative to gradually replace stove heating with gas in all public schools. The Government is also working with the World Bank to implement efficient and clean heating stoves in Bishkek by 2023 in the framework of the “Heat Supply Improvement Project”.³⁹

The Government actively uses donor support to implement initiatives and projects to mitigate the negative impacts of urbanization and to improve the quality of the environment in Bishkek. In 2020, the Mayor’s Office launched the project "Improvement of the Solid Waste Management System in Bishkek".⁴⁰ The project is supported by EBRD and aims to create a better solid waste management system including the construction of a new sanitary landfill and a waste-sorting plant. Bishkek also invests in improving its water and sanitation infrastructure, for instance as part of the project "Rehabilitation of Water Supply and Sewage in Bishkek - Phase 2".⁴¹ The city administration is also planning to use funding provided by the World Bank to expand green spaces in the city from 60 hectares in 2021 to 400 hectares in 2023⁴².

³⁶ Cabinet of Ministers of the Kyrgyz Republic, *The Plan of Comprehensive Measures to Improve the Environmental Situation in Bishkek City and Sokuluk and Alamudun Districts of Chui Oblast for 2021-23 was approved, 6 January 2021*. Available at: <https://www.gov.kg/ru/post/s/utverzhdn-plan-kompleksnykh-mer-po-uluchsheniyu-ekologicheskoy-situatsii-v-gorode-bishkek-i-sokulukskom-alamudunskom-rayonakh-chuyskoy-oblasti-na-2021-2023-gody>.

³⁷ UNDP Kyrgyz Republic, *Air Pollution in the attention of the Government and international organizations, 10 March 2020*. Available at: <https://www.kg.undp.org/content/kyrgyzstan/en/home/presscenter/pressreleases/2020/03/air-pollution-in-the-attention-of-the-government-and-international.html>

³⁸ IQAir Bishkek Air Quality, *Air Quality Index (AQI) and PM2.5 air pollution in Bishkek*. Available at: <https://www.iqair.com/us/kyrgyzstan/bishkek>.

³⁹ World Bank, Kyrgyz Republic, *Country Partnership Framework for the Period FY19-FY22* (English). Available at: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/358791542423680772/kyrgyz-republic-country-partnership-framework-for-the-period-fy19-fy22>

⁴⁰ Tenders Electronic Daily, Supplement Journal to the Official Journal of the EU, *Kyrgyzstan—Bishkek: EBRD—Kyrgyz Republic: Bishkek Solid Waste Project*. Available at: <https://ted.europa.eu/udl?uri=TED:NOTICE:213684-2020:TEXT:EN:HTML>

⁴¹ Ministry of Justice of the Kyrgyz Republic, *Rules for the use of water supply and sewerage systems in Bishkek city, 8 December 2005*. Available at: <http://cbd.minjust.gov.kg/act/view/ru-ru/23526>.

⁴² Cabinet of Ministers of the Kyrgyz Republic, *The Plan of Comprehensive Measures to Improve the Environmental Situation in Bishkek City and Sokuluk and Alamudun Districts of Chui Oblast for 2021-23 was approved, 6 January 2021*. Available at: <https://www.gov.kg/ru/post/s/utverzhdn-plan-kompleksnykh-mer-po-uluchsheniyu-ekologicheskoy-situatsii-v-gorode-bishkek-i-sokulukskom-alamudunskom-rayonakh-chuyskoy-oblasti-na-2021-2023-gody>.

Box 3: “Strengthening disaster resilience and accelerating implementation of Sendai Framework for Disaster Risk Reduction in Central Asia” and development of the Disaster Resilience Strategy for Bishkek (2021/22)
The United Nations Office for Disaster Risk Reduction (UNDRR) Regional Office for Europe and Central Asia (ROECA), within its project “Strengthening disaster resilience and accelerating implementation of Sendai Framework for Disaster Risk Reduction in Central Asia”, engages with the capital cities in the region. This project aims to support local governments reduce risks and advance a holistic and systemic approach to urban resilience. This initiative is funded by the European Union and will contribute directly to the achievement of SDG 11 and other global frameworks in the region, including the Sendai Framework for Disaster Risk Reduction, the Paris Agreement and the New Urban Agenda.

The initiative envisages the development of the Disaster Resilience Strategy for the capital city including pandemic risk and biological hazards. The strategy development process will be based on the baseline analysis received through a set of self-assessments conducted by the Technical Working Group established by the City Administration with the support of UNDRR ROECA. The self-assessments include the use of the Preliminary Scorecard Assessment, the Public Health System Resilience Scorecard (also called Public Health Addendum) and the Detailed Scorecard Assessment.

The Resilience Scorecards were developed by the International Business Machines Corporation (IBM), AECOM and UNDRR with support from the European Commission and the United States Agency for International Development (USAID). They were adopted at the 5th session of the Global Platform for Disaster Risk Reduction, held in Cancun, in May 2017. Currently, the scorecards are used by over 200 cities around the world to ensure the resilience of critical infrastructure. The Resilience Scorecards provide a set of assessments that allow local governments to assess their disaster resilience, helps to monitor and review progress and challenges in the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 and supports the baseline analysis for preparation of disaster risk reduction and resilience strategies.

Bishkek was the first city in Central Asia to join the global initiative “Making Cities Resilient 2030” (MCR2030). MCR2030 is a unique cross-stakeholder initiative for improving local resilience through advocacy, sharing knowledge and experiences, establishing mutually reinforcing city-to-city learning networks, injecting technical expertise, connecting multiple layers of government and building partnerships.

Note: AECOM is a multi-national engineering firm, and it stands for Architecture, Engineering, Construction, Operations and Management.

Environment dimension – KPI evaluation results

Bishkek reported data on 16 out of 28 indicators for the environment sector. The city did not report on 12 indicators across the following categories of the environment dimension: air quality, water and sanitation; waste; environmental quality; public space and nature; and energy.⁴³

The following observations were based on the results of the evaluation:

Electricity and residential thermal energy consumption

Both electricity and residential thermal energy consumption are relatively low – inhabitants consume an average of 2.4 kilowatt hours (kWh) of electricity per year per capita, and 7.2 gigajoules (Gj) per year per capita.⁴⁴

⁴³ The specific indicators not reported were: Quantity of ozone (O₃) in the air; Greenhouse gas (GHG) emissions per capita; Water consumption per capita; Amount of waste disposed into open dumps; Electromagnetic field (EMF) exposure; Noise exposure; Green areas; Green area accessibility; Protected natural areas; Recreational facilities; Renewable energy consumption; and Public building energy consumption.

⁴⁴ UNECE, *National Sustainable Energy Action Plan of the Kyrgyz Republic, 2019*. Available at: https://unece.org/fileadmin/DAM/project-monitoring/unda/16_17X/E2_A2.3/NSEAP_Kyrgyzstan_ENG.pdf.

According to data provided by the State Agency for Hydrometeorology, there are 50 micrograms (μg) per cubic metre (m^3) of particulate matter (PM 10), and 70 μg per m^3 of Nitrogen Dioxide (NO_2) – both of which are slightly above WHO-recommended levels.⁴⁵ There is 3 μg per m^3 of sulphur dioxide (SO_2) in the air, which is well below the recommended level of 20 μg per m^3 . The level of PM 2.5, at 36 μg per m^3 , is higher than WHO-recommended levels -10 μg per m^3 or lower.

Water and sanitation

Bishkek has good quality drinking water, with 100 per cent of water supply coming from freshwater sources and all water samples tested meeting WHO standards.⁴⁶ Wastewater undergoes three stages of treatment: i) mechanical treatment, ii) complete biological wastewater treatment, bringing the concentration of pollutants according to biological oxygen demand (BOD5) and suspended solids to 15 mg and iii) disinfection and dischargement of the treated wastewater through a 22-km long canal in the Chuy river.⁴⁷

Solid waste management

The entire city is served by solid waste collection facilities but has a very weak performance on waste recycling. Food and other organic waste comprise almost half (49 per cent) of all solid waste in the city; however, only 2.5 per cent of it is recycled for biogas. The recycling rates for solid plastic waste and glass are both below 4 per cent. Further, 5.5 per cent of paper waste is recycled while recycling rates for metals and textile wastes are both at 0.5 per cent.

Society and culture – an overview

Bishkek has taken important steps towards improving its social and cultural infrastructure and services, including education, safety and healthcare. In 2020, the city adopted the Kyrgyz Republic Government Action Plan which aims at improving social inclusion and healthcare, while combatting the COVID-19 pandemic. It includes building new hospitals, implementing awareness-raising actions and campaigns addressing the COVID-19 pandemic and providing enough personal protective equipment (PPE).⁴⁸

The city aims to improve access to education for all. It is home to three special needs schools and 11 special preschool educational institution, which provide inclusive and specialized education; and a private school which allocates 20 per cent of its places to children with special needs. In 2020, the city allocated funding for constructing a new kindergarten in the Oktyabrsky district that could accommodate 140 children.

To support the implementation of the Government Plan for 2019-2023⁴⁹ and its goal of improving living standards and access to justice system, the city provides free legal assistance to families and children, complementary to other services offered by the city such as the Centre for Assistance to Children Affected by Violence and Abuse in Bishkek.

The city is investing in providing e-services to all its citizens across various areas, for instance, education and healthcare. In 2018, Bishkek introduced an online portal where parents can register their children for preschool

⁴⁵ World Health Organization, *WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulphur dioxide, Global Update 2005*, Summary of Risk Assessment. Available at:

https://apps.who.int/iris/bitstream/handle/10665/69477/WHO_SDE_PHE_OEH_06.02_eng.pdf?sequence=1

⁴⁶ WHO, *Guidelines for Drinking-water quality, 2017*. Available at:

<https://apps.who.int/iris/bitstream/handle/10665/254637/9789241549950-eng.pdf?sequence=1>

⁴⁷ Primary treatment screens and sediment sewage to remove grosser debris. Secondary treatment reduces Biological Oxygen Demand (BOD10) to acceptable levels by microbial oxidation using activated sludge or a trickle filter. Tertiary treatment reduces BOD still further through micro straining or filtering, the microbial removal of phosphates and nitrates, and disinfection using chlorine or ozone.

⁴⁸ Cabinet of Ministers of the Kyrgyz Republic, *Press Release, The Government's Action Plan for 2020 was approved to ensure social stability, economic sustainability, 22 August 2020*. Available at: <https://www.gov.kg/ru/post/s/utverzhden-plan-deystviy-pravitelstva-na-2020-god-po-obespecheniyu-sotsialnoy-stabilnosti-ustoychivosti-ekonomiki>

⁴⁹ UNECE, *National Level-Review of the Kyrgyz Republic, On the Implementation of the Beijing Declaration Platform for Action, Progress and Challenges, n.g.* Available at : https://unece.org/fileadmin/DAM/Gender/Kgz_Beijing_25_Review_English_Final.pdf

education from the age of 6 months onwards.⁵⁰ Since 2019, the “Electronic Enrolment in Schools” project has been offering a similar online service that allows processing of primary-school enrolment when children reach the school age of 6-7 years.

In 2018, Bishkek became one of the Kyrgyz cities to implement the “Electronic enrolment for doctor appointments” project, allowing inhabitants to register for medical appointments easily. An automatic identification system (AIS) - “Personal account of the insured person” - was also introduced allowing citizens to receive insurance information and send requests and applications electronically. As of 2019, 58,015 insured persons were registered in the AIS system of the Social Fund of the Kyrgyz Republic.

Bishkek is also taking considerable steps to improve access to adequate and affordable housing in line with the 2012 Action Plan for implementing the socio-economic programme “Stability and Decent Life”; the “Affordable Housing 2015-2020” programme, and the National Development Strategy of the Kyrgyz Republic for 2018-2040. These documents all recognized the importance of supporting adequate housing for all in Bishkek, particularly due to factors such as increasing rural to urban migration.⁵¹ In this context, the city of Bishkek collaborates with UNECE on the formalization of informal settlements in the neighbourhoods of Ak-Bosogo, Archa-Beshik, Kalis Ordo, Bakai-Ata, and Rukhiy-Muras.

The city has also taken steps towards improving its road safety. In 2019, the “Safe City”⁵² project was launched and included measures such as pruning trees that limit road visibility, installing road signs and markings, and modernizing old traffic lights.

In the years to come, Bishkek will further invest in modernization and provision of education infrastructure. It will provide access to ICTs in classrooms and ensure that teachers receive further professional development and guidance. As part of the 2018-2040 National Development Strategy, Kyrgyzstan is aiming to increase monthly family incomes to USD 450.

Society and culture – KPI evaluation

On the society and culture dimension of the KPI evaluation, Bishkek reported data on 26 of the 29 total indicators. Three indicators were not reported across the following categories of the society and culture dimension: safety and food security.

The following are based on the results of the evaluation:

Health and healthcare

Bishkek has 234 physicians per 100,000 inhabitants (compared to 369 per 100,000 on average for EU countries)⁵³, and 199 hospital beds per 100,000 (the global average is 289 per 100,000).⁵⁴ Some 69 per cent of Bishkek inhabitants are covered by a public health system or health insurance. The average life expectancy of 74.6 years is slightly below the European average of 81 years,⁵⁵ and the maternal mortality rate of 12.5 deaths

⁵⁰ The system prioritises places for those who have waited the longest, and parents can register children from the age of 6 months onwards.

⁵¹ UN Sustainable Development Goals in the Kyrgyz Republic, *Voluntary National Review on the Implementation of the Sustainable Development Goals in the Kyrgyz Republic, 2020*. Available at:

https://sustainabledevelopment.un.org/content/documents/26459VNR_2020_Kyrgyzstan_Report_English.pdf p66

⁵² Bishkek City Hall, *Press Release, Bishkek Mayor’s Office is completing preparations for the first stage of the Safe City project, 2019*. Available at: <https://www.meria.kg/ru/post/17913>

⁵³ European Health Information Gateway, *Physicians per 100,00 inhabitants*. Available at:

https://gateway.euro.who.int/en/indicators/hfa_494-5250-physicians-per-100-000/

⁵⁴ World Bank, *Hospital Beds per 1,000 people*. Data are from the World Health Organization, supplemented by country date. Available at: <https://data.worldbank.org/indicator/SH.MED.BEDS.ZS?end=2017&start=1970&view=chart>

⁵⁵ Eurostat, *Life Expectancy across EU regions*, 30 September 2020. Available at:

<https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20200930-1>.

per 100,000 live births is very low according to UNICEF standards.⁵⁶ There were no inhabitants reported to have electronic health records.

Education

The school enrolment and classroom ICT access rates were high (77 per cent and 53 per cent, respectively). The adult literacy rate is 61 per cent which is below the global average of 86 per cent.⁵⁷ Bishkek has 16,130 higher education degrees per 100,000 inhabitants, while EU has an average of approximately 40,000.⁵⁸

Safety

There are relatively low traffic fatalities at 7 fatalities per 100,000 inhabitants per year. Additionally, there were 563 violent crimes per 100,000 inhabitants.

None of the population lives in a zone prone to natural hazards. The disaster-related economic losses of Bishkek were low at 0.2 per cent of the city's GDP. Bishkek has not implemented resilience plans according to the Sendai Framework for Disaster Risk Reduction 2015-2030.⁵⁹

Social inclusion

The Gini coefficient⁶⁰ of Bishkek was 0.36, a little below the EU average of 0.38.⁶¹ As a lower Gini coefficient suggests higher equality, this suggests a slightly higher economic equality in Bishkek than throughout the EU.

On gender income equality, female hourly earnings represent 83 per cent of male hourly earnings.

Voter participation in Bishkek municipal elections is quite low at 43 per cent of the eligible voting population. 11.9 per cent of inhabitants were reported to be living below the national poverty line, and the proportion of pre-school aged children with access to childcare facilities is low (0.5 per cent).

Socio-economic impacts of the COVID-19 pandemic in Bishkek

Overview

The outbreak of the COVID-19 pandemic severely weakened the macroeconomic and financial outlook of the Kyrgyz economy, impacting virtually all sectors. Bishkek is the major economic centre of the Kyrgyz republic and boasting over 60 percent of the country's SMEs, the economic and social impacts have been particularly visible in the capital city. In terms of revenues, in 2020 the city of Bishkek faced a financial shortfall of KGS 1.5 billion⁶² (close to USD 18 million).

The country was placed under emergency footing on 22 March 2020 and Bishkek, like all the other cities of the country, entered a strict lockdown. The national Government imposed border restrictions and suspended all

⁵⁶ UNICEF, *Maternal Mortality, September 2019*. For reference, UNICEF considers less than 100 deaths per 100,000 live births to be "very low". Available at: <https://data.unicef.org/topic/maternal-health/maternal-mortality/>.

⁵⁷ World Bank, *Literacy rate, adult total (% of people ages 15 and above) with data from UNESCO Institute for Statistics. Data as of September 2020*. Available at: <https://data.worldbank.org/indicator/SE.ADT.LITR.ZS>

⁵⁸ Eurostat, *Educational attainment statistics, 2020*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_attainment_statistics

⁵⁹ UNDRR, *What is the Sendai Framework for Disaster Risk Reduction?* Available at: <https://www.undrr.org/implementing-sendai-framework/what-sendai-framework>

⁶⁰ The Gini coefficient is "based on the comparison of cumulative proportions of the population against cumulative proportions of income they receive, and it ranges between 0 in the case of perfect equality and 1 in the case of perfect inequality". OECD, *Income Inequality*. Available at: <https://data.oecd.org/inequality/income-inequality.htm>.

⁶¹ Eurostat, *Gini coefficient of equivalised disposable income—EU-SILC survey*. Available at: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di12&lang=en

⁶² UNECE, *Towards a Smart Sustainable City and Post-COVID-19 recovery Online workshop Bishkek 10 March 2021*. Available at: <https://unece.org/housing/events/bishkek-workshop-sustainable-smart-city>

domestic and international flights. While essential from a health perspective, the combined effects of, inter alia, businesses and market closures, restrictions on mobility, reduced inflow of remittances (around 25 per cent less than in 2019) and the disruption in the supply of raw materials and goods and services resulted in around -8.6 per cent GDP in 2020, causing USD 400-500 million national budget deficit^{63,64}. Initial estimates published in the “Asian Development Outlook” of the Asian Development Bank suggest that the economy of Kyrgyzstan is expected to recover slowly in 2021 and pick up pace in 2022. Currently, the size of the country’s economy is forecasted to grow by 3.5 per cent in 2021 and 5 per cent in 2022.

To meet the urgent balance of payments and help catalyse donor support and free resources for essential COVID-19-related health expenditures, the International Monetary Fund disbursed almost USD 242 million in emergency relief, adding to the USD 120 million from the Asian Development Bank and further pledges made by the World Bank and the United Nations system⁶⁵. In terms of coordination, in March 2020, the Government requested the activation of the Disaster Response Coordination Unit (DRCU), a multisectoral response mechanism for emergency situations. Under the leadership of the United Nations Resident Coordinator, DRCU has been mobilizing other key international organizations such as the International Red Cross and NGOs working on the ground to respond to the most pressing needs imposed by the COVID-19 pandemic. The following paragraphs detail some of the preliminary impacts in a number of essential sectors (other than health) in Bishkek. Where urban level data was not available, national level statistics were provided.

Local economy and unemployment

Based on a survey conducted by the Economic Policy Research Institute of the Ministry of Economy. 65 per cent of all poor households in Bishkek suffered some degree of financial stress due to the COVID-19 pandemic⁶⁶. Expert interviews conducted for this study suggest that unemployment rate grew massively due to the impact of the pandemic. Although the actual number is unknown, there is a high number of construction workers, drivers, industrial workers, sowers and small-scale traders relying on in-person contact who are currently out of work in Bishkek. In this context, the city’s 3.75 per cent budget spending on labour social protection⁶⁷, amounting to around KGS 26.7 million (around USD 315,000), proved inadequate to cope with the unemployment surge caused by the pandemic.

The shutdown of the tourism sector throughout 2020 heavily impacted the economy. The tourism sector’s contribution to the overall national GDP fell from 5.1 per cent in 2019 to 2.9 per cent in 2020⁶⁸. A further driver of unemployment rates and economic depression is connected to a significant reduction in the inflow of remittances from Kyrgyz economic migrants who returned home due to terminations of or temporary interruptions in their working contracts abroad. During the first five months of 2020, the Asian Development Bank estimated a 25-per cent decline in the inflow of remittances. Remittances play a major role in the Kyrgyz economy, accounting for 28 per cent of the country’s GDP in 2019⁶⁹. Remittances fell due to travel restrictions

⁶³ Asian Development Bank, *COVID-19 in the Kyrgyz Republic: Socioeconomic and Vulnerability Impact Assessment and Policy Response*, August 2020. Available at: <https://www.adb.org/sites/default/files/institutional-document/626021/covid-19-kgz-socioeconomic-vulnerability-impact.pdf>.

⁶⁴ International Monetary Fund, *IMF Staff Country Reports, Kyrgyz Republic, May 2020*. Available at: <https://www.imf.org/en/Publications/CR/Issues/2020/05/12/Kyrgyz-Republic-Request-for-Purchase-Under-the-Rapid-Financing-Instrument-and-Disbursement-49408>

⁶⁵ Asian Development Bank and United Nations Development Programme, *COVID-19 in the Kyrgyz Republic: Socioeconomic and Vulnerability Impact Assessment and Policy Response*, August 2020. Available at: <https://www.adb.org/sites/default/files/institutional-document/626021/covid-19-kgz-socioeconomic-vulnerability-impact.pdf>.

⁶⁶ Ibid.

⁶⁷ UNECE, *UNDA 13th tranche project on building urban economic resilience during and after COVID-19 Diagnostic Tool, Bishkek, 2021 (unpublished)*.

⁶⁸ National Statistical Committee of the Republic of Kyrgyzstan, *Indicators of Tourism Development*. Available at: <http://www.stat.kg/en/opendata/category/130/>.

⁶⁹ World Bank, *The World Bank in the Kyrgyz Republic, Country Snapshot, April 2020*. Available at: <https://pubdocs.worldbank.org/en/788871587186957851/Kyrgyz-Republic-Snapshot-Apr2020.pdf>

and the oil price shock which affected the Russian Federation and Kazakhstan, where most Kyrgyz migrants work⁷⁰. Finally, lockdowns and border closures also affected the activities in the shadow economy which, according to official estimates, account for 23 per cent of the country's economy.⁷¹

National and local leaders are urged to improve social protection for those who became unemployed during the pandemic and take steps to integrate returning migrants into the Kyrgyz economy⁷².

Box 4: UNDA 13th tranche project on building urban and economic resilience during and after COVID- 19 – 2020/2021

This project, also implemented in Bishkek, focuses on strengthening the capacities of local governments in sixteen cities globally to design, implement and monitor sustainable, resilient and inclusive COVID-19 economic and financial responses, recovery and rebuilding plans. The immediate impact of the project will be the provision of good global practices from other cities, which will inform the pilot cities in their activities to develop and implement their response and recovery plans to the COVID-19 pandemic.

The project aims to develop a better understanding of the key factors and drivers of urban economic resilience as well as solutions that work and will contribute to a practical framework for creating more resilient cities and make local governments able to better withstand shocks such as the COVID-19 pandemic and other broad-based socio-economic stresses that are likely to reoccur in a predominantly urban world.

The UNDA 13th tranche project has four main activities: i) project development of a global urban economic recovery and resilience diagnosis and planning tool for the sixteen pilot cities; ii) development of an online training programme and organization of global, regional and local training workshops; iii) support to the pilot cities with the preparation of their economic recovery and resilience plans; and iv) advice on possible funding sources for economic development and infrastructure projects supporting the urban economic recovery.

The project is implemented by the United Nations Capital Development Fund (UNCDF), UN-Habitat and the five United Nations Regional Commissions: UNECE, UNECA, ECLAC, ESCWA, ESCAP.

Abbreviations: UNECA, United Nations Economic Commission for Africa; ECLAC, Economic Commission for Latin America and the Caribbean; ESCWA, Economic and Social Commission for Western Asia; ESCAP, Economic and Social Commission for Asia and the Pacific

Education

While the Kyrgyz Republic is making considerable progress in providing internet access and digitalizing public services, schools were not prepared to switch to remote learning. Approximately 2.4 million children and young people nationwide were affected by the closure of schools-⁷³ Lack of equipment such as laptops and a reliable internet connection were reported, resulting in major disruptions for people's education. A high number of

⁷⁰Asian Development Bank and United Nations Development Programme, *COVID-19 in the Kyrgyz Republic: Socioeconomic and Vulnerability Impact Assessment and Policy Response*, August 2020. Available at:

<https://www.adb.org/sites/default/files/institutional-document/626021/covid-19-kgz-socioeconomic-vulnerability-impact.pdf>.

⁷¹ European Bank for Reconstruction and Development, *Responding to the Coronavirus, Crisis Update on the Kyrgyz Republic*, 11 June 2020 (pdf).

⁷² Asian Development Bank, *Kyrgyz Republic, GDP growth forecast, Kyrgyz Republic Economy to Rebound in 2021 and 2022 Despite Risks—12 May 2021*. Available at: <https://www.adb.org/news/kyrgyz-republic-economy-rebound-2021-and-2022-despite-risks-ADB>.

⁷³ Humanitarian Response, *Disaster Response Coordination Unit, Kyrgyzstan: COVID-19 response*, 3 July 2020. Available at: https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/weekly_situation_update_3_july_2020.pdf.

students in Bishkek may have also been unable to attend school at all during the lockdown given that around 15 per cent of Bishkek’s inhabitants do not have any connection to the internet⁷⁴.

The coordination mechanism overseen by the United Nations Resident Coordinator in the Kyrgyz Republic noted that the country’s 100,000 teachers needed clear instructions for providing and monitoring remote learning. As of July 2020, there were about 500,000 parents and caregivers in the country needing recommendations on how to effectively support children learning from home. In this context, relevant authorities may consider temporarily reallocating funds that normally go into the mandatory provision of meals for pupils, for e-learning equipment and other key priorities.

Food security

The COVID-19 pandemic was a biting reminder that when abrupt economic crises take place, vulnerable residents are the first ones to be impacted and most prominently. In Bishkek, where around 30 per cent of the city’s one million residents live in informal settlements and where work is predominantly undertaken in-person, food security became a major issue.

In July 2020, the DRCU estimated that 500,000 people nationwide required immediate direct food assistance and that close to two million people would be needing food or cash assistance in the short-term. Throughout April and May 2020, the World Food Program, in coordination with the Ministry of Labour and Social Development, delivered over 2,040 metric tons of food to about 64,000 beneficiaries. In March 2021, the Mayor’s Office of Bishkek reported that basic food supplies were successfully delivered to 150,000 people in the city and received KGS 25 million (approximately USD 300,000) from the government as basic social assistance.

Due to financial and capacity shortfalls in delivering food assistance, the Government submitted a funding request to the World Bank for the procurement of essential nutrition supplies for pregnant women and young children.

Transport

Reduced transport ridership due to lockdowns and restrictions on movement heavily impacted the transport sector. This sector is a key industry for the economy of Kyrgyzstan contributing 4 per cent to GDP.⁷⁵ With around 8 per cent of the population nationwide working in the transportation sector, the pandemic damage led to increased unemployment.⁷⁶ Transport challenges also had a significant impact on trade and on import from neighboring China and the Russian Federation. During the quarantine period, cargo and passenger transportation (taxi service) were brought to a halt⁷⁷. The grounding of transport exacerbated existing issues for people not receiving timely medical help.

Box 5: COVID-19 recovery through investment in public transport

At a time of mass unemployment, local governments are demanding investment in public transport to create jobs and help in the recovery from the COVID-19 pandemic. A recent report which surveyed 100 cities globally within the C40 Cities Climate Leadership Group (C40) found that investment in mass urban transit could create some 4.6 million additional jobs by 2030⁷⁸. If investment is scaled up to other major cities, tens

⁷⁴ UNECE, *Collection Methodology for Key Performance Indicators for Smart Sustainable Cities, KPI Evaluation, September 2017*. Available at: <https://unece.org/DAM/hlm/documents/Publications/U4SSC-CollectionMethodologyforKPIfoSSC-2017.pdf>.

⁷⁵ Asian Development Bank and United Nations Development Programme, *COVID-19 in the Kyrgyz Republic: Socioeconomic and Vulnerability Impact Assessment and Policy Response, August 2020*. Available at: <https://www.adb.org/sites/default/files/institutional-document/626021/covid-19-kgz-socioeconomic-vulnerability-impact.pdf>.

⁷⁶ Ibid.

⁷⁸ C40 Cities, *The Future of Public Transport, Investing in a Frontline Service for Frontline Workers, 2021*. Available at: <https://thefutureispublictransport.org/wp-content/uploads/2021/03/C40-The-Future-of-Public-Transport-Research.pdf>

of millions of jobs could be created. In addition to local economic development, public transport improves air quality, decreases energy consumption, lowers GHG emissions and traffic congestion.

Note: The C40 Cities Climate Leadership Group is a network of 97 cities around the world that represents one twelfth of the world's population and one quarter of the global economy.

Recommendations

This set of policy recommendations aims to help Bishkek accelerate progress towards the achievement of the SDGs and embark on a smart and sustainable growth pathway.

Based on the KPIs for SCC evaluation results and review of documentary data, including information provided by the city, desk research and expert interviews, it is recommended to:

1. Strengthen the linkage between urban policy design and infrastructure financing and implementation.

- a. **Improve institutional and governance framework towards integrated and long-term urban planning.** City departments and agencies should establish direct and effective communication lines, sharing best practices and communicating their work with each other. Cross-sectoral collaboration from the early phases of project and programme development process should target the identification and delivery planning of multiple and integrated benefits (e.g., economic, social, environmental, health etc.). Identifying and communicating integrated benefits of key infrastructure developments (e.g., job creation for construction, operation and maintenance) enhances the mobilization of political and community support, which is in turn will be fundamental to create the right conditions to attract financing, especially from bilateral and multilateral development institutions⁷⁹. Data-driven and detailed plans for policy implementation and monitoring and evaluation are also essential.
- b. **Develop a socio-economic development programme for 2022-2024 and explore innovative financing mechanisms for basic and social infrastructure delivery.** Bishkek faces increasing municipal costs due to a growing population, congestion, deterioration of the environment, as well as the short and long-term impacts of the COVID-19 pandemic. However, its municipal budget is set to stagnate in the next years. To revive the urban economy and enhance the delivery of inclusive and sustainable infrastructure, a socio-economic development programme for 2022-2024 should be developed. This programme should create favourable conditions for the revival of entrepreneurial activity, for instance through the creation of a "development fund" to incentivize the creation of start-ups and SMEs. Furthermore, grant funds from international donors such as multilateral and bilateral development banks shall be leveraged, especially through access to project preparation facilities⁸⁰. Efforts should also be enhanced to improve the regulatory

⁷⁸ C40 Cities, *The Future of Public Transport, Investing in a Frontline Service for Frontline Workers*, 2021. Available at: <https://thefutureispublictransport.org/wp-content/uploads/2021/03/C40-The-Future-of-Public-Transport-Research.pdf>

⁷⁹ World Bank, *Press Releases, World Bank Group Announces Ambitious 35% Finance Target to Support Countries' Climate Action*, 9 December 2020. <https://www.worldbank.org/en/news/press-release/2020/12/09/world-bank-group-announces-ambitious-35-finance-target-to-support-countries-climate-action>

⁸⁰ The Cities Development Initiative for Asia (CDIA) is a multi-donor trust fund managed by the Asian Development Bank. CDIA works closely with secondary cities in Asia (between 250,000 and 5 million people) and provides support in the preparation of sustainable and bankable infrastructure projects, links cities with funding sources and helps strengthen local capacities to develop and implement their high priority investments. Since 2007, CDIA supported 88 cities, 155 projects and leveraged USD 11.2 billion.

framework to attract investment from national banks, for instance through PPPs. The socio-economic development programme for 2022-2024 should also guide investment in key sectors which were heavily impacted by the pandemic, such as education. Additionally, national policies such as the Budget Code need to be amended to allow the city to design and implement financial mechanism in line with the market economy.

- c. **Develop a city level repository to gather disaggregated urban level data.** Bishkek is encouraged to continue collaborating with national level stakeholders such as the National Statistical Committee of the Kyrgyz Republic and other relevant national and international stakeholders to continue collecting and maintain its geo-spatial infrastructure. Due to the high volume of informal settlements and unregistered land plots, national and international cooperation projects should continue to map, register and digitize vast amounts of land/property data.
- d. **Improve methodologies and standards for collecting and managing urban data.** Policymakers are encouraged to work towards standardized methods for collecting and aggregating city level data and improve access to open-source data. Finally, the improvement of governance structures should also include programmes and trainings for education and skills development within the city administration and beyond to improve cooperation (e.g., national statistical agency etc.).

2. Legalize, upgrade and redevelop informal settlements.

- a. **Develop an inventory of all land plots and create a unified registry of all informal settlements.** Building on existing formalization efforts, work should continue to map all land plots and homes in existing informal settlements. The identification of citizens without identity documents (e.g., passports, birth certificates) and assistance to obtain the necessary documents should be provided by local actors with experience in community outreach and in organizing (for instance, through NGOs, community organizations, the social security service of the Bishkek Mayor's Office and Municipal Territorial Administrations). Additionally, residential homes which have been repurposed as small businesses need to change their registration from residential to commercial, in accordance with the Regulation "On the procedure for issuing documents for the design, construction and other changes in real estate and assessment..."
- b. **Amend key planning regulation to improve formalization procedures.** Paragraph 32 of the Regulation "On the procedure for granting land plots for individual housing construction in Bishkek" should be amended to remove the current ban on the formalization of land plots that were appropriated after 1999.
- c. **Upgrade informal settlements through an integrated and participatory approach to basic and social infrastructure delivery. Upgrading of informal settlements is a delicate process which requires a context-based, integrated and participative approach, ultimately aimed at eradicating poverty and improving quality of life. A detailed list of recommendations and lessons learned from the UNECE region is compiled in the *Formalizing the Informal* publication⁸¹. Where possible, upgrading is preferred to redevelopment since it does not disrupt existing social and economic networks. Example of basic infrastructure priorities are the provision of water and sanitation infrastructure, centralized heating, thermal insulation, solid waste management, drainage, road improvements and public lighting, among others. When land is not in municipal ownership, the city should acquire land plots to provide social infrastructure, including nurseries, kindergartens, schools, public/green spaces and cultural facilities.**
- d. **Design a socially just coal-phase out.** Many informal settlement residents utilize coal for heating, which has major repercussions on the environment and people's health (especially young children).

⁸¹ International Federation of Surveyors and UNECE, *Formalizing the Informal, Challenges and Opportunities of Informal Settlements in South-East Europe, 2015*. Available at: https://unece.org/sites/default/files/2020-11/Formalizing_the_Informal_Challenges_and_Opportunities_of_Informal_Settlements_in_South-East_Europe.pdf

Phasing out coal is a major priority for Bishkek. A pathway to phasing-out coal without increasing energy poverty needs to be established. International best practices suggest that, in informal settlements, coal can be substituted by more sustainable sources such as Liquefied Petroleum Gas (LPG), fuel-efficient briquettes from semi-coke and electricity.

- e. **Identify residential houses located in unsafe areas and begin relocation procedures.** A high number of informal settlements is in areas that are prone to flooding and other disasters. In such cases, relocation procedures should be accompanied by fair compensations or should be in exchange of formal affordable housing options. The active involvement of informal settlement residents is important to this process.

3. Develop a formal affordable housing programme following compact urban development.

- a. **Develop an affordable housing programme, both for sale and for rent, that is realistically achievable for those on low and middle incomes.** The influx of over 400,000 new residents in the next 15 years calls for the development of formal, affordable housing. The development of technical assessments to understand local housing needs at different income levels is an essential first step. Innovative municipal financing instruments mixing a variety of public and private sources (PPPs) as well as land-based instruments (e.g., land-value capture mechanisms⁸²) should be considered. In this context, international programmes (both for technical assistance and hard infrastructure financing) for the development of affordable housing programmes are available, for instance, through the World Bank, Asian Development Bank etc.
- b. **Pursue compact urban development through incentives for the development, redevelopment and infill of underused or vacant land plots.** It is often agreed that producing population densities of about 9,000 people per m² yield important benefits such as the financial viability of infrastructure development⁸³. Currently, the average population density in Bishkek is around 6,000 people per m².⁸⁴ For instance, the “catchment area” of a transport or water sanitation project reaches more people if the area is denser, thus making it financially more efficient to operate and maintain for the municipality. Therefore, a compact urban form enhances economic productivity through increased access to key infrastructure and amenities, while also reducing energy consumption, carbon emissions (e.g., reduced Vehicles Kilometres Travelled) and saving time of residents⁸⁵.

4. Develop sustainable urban transport infrastructure.

- a. **Invest in low-carbon public transport infrastructure.** Increasing population pressure, traffic congestion and harmful air quality call for the development of an urban public transport system. Mobility options such as bus rapid transit (BRT) corridors can help reduce energy consumption, lower GHG emissions and air pollution and improve access to key services such as employment, schools, hospitals, parks etc. The expansion of the public transport infrastructure is also conducive to higher economic productivity and time savings for urban residents. Targeting high-density areas and new and extended mobility routes also become more financially viable and replicable.
- b. **Sharing mobility options should be expanded.** Sharing mobility provide a path to reducing reliance on private vehicles, which helps reduce congestion and improve quality of life. The uptake of sharing mobility options can also produce quality job for operation and maintenance.

⁸² Lincoln Institute of Land Policy, *Value Capture and the Property Tax*. Available at: <https://www.lincolnst.edu/key-issues/value-capture-property-tax>

⁸³ The New Climate Economy, *Demystifying Compact Urban Growth: Evidence from 300 Studies From Across the World, September 2017*. Available at: <https://newclimateeconomy.report/workingpapers/workingpaper/demystifying-compact-urban-growth/>

⁸⁴ Knoema, *World Data Analysis, Kyrgyzstan, Bishkek*. Available at: <https://knoema.com/atlas/Kyrgyzstan/Bishkek>

⁸⁵ The New Climate Economy, *Demystifying Compact Urban Growth: Evidence from 300 Studies From Across the World, September 2017*. Available at: <https://newclimateeconomy.report/workingpapers/workingpaper/demystifying-compact-urban-growth/>

5. Improve internet access and digital literacy.

- c. **Provide reliable internet access to all households.** The COVID-19 induced lockdowns and the shift to home office and home schooling further increased the need to provide internet access to all households. The KPI evaluation of Bishkek revealed that around 15 per cent of households do not have internet access. In addition to delivering internet to households without access, the city should look into installing public Wi-Fi hotspots.
- d. **Improve digital literacy.** The pandemic also showed that a high number of children and parents are not digitally literate. Digital literacy is key to increase the productivity and skills of the population, from young children to students and adults. The city should invest in improving digital literacy through training programmes, especially in schools.

6. Improve the water and sanitation infrastructure.

- a. **Deliver water and sanitation infrastructure in informal settlements.** This study found that the water and sanitation infrastructure is underdeveloped in many areas of the city such as informal settlements. In the Ak-Basogo informal settlement, only 31 per cent of the population has access to a toilet. The city should utilize the data collected in the study that are contained in the “Report on Post-COVID-19 recovery in informal settlements of Bishkek City” and further assess areas that are most in need of the services and expand the delivery of water and sanitation across the city.
- b. **Improve the lifespan of the existing water and sanitation infrastructure by investing in its renovation.** Currently, 22 per cent of water is lost from the water distribution system. Water supply loss could be reduced through investment in better ICT monitoring of urban water networks, including introducing “smart” water metres (currently, there are none in Bishkek), and setting up a drainage and storm water ICT monitoring system as the drainage and storm water system is not monitored by ICTs. Decision makers are also encouraged to further engage with the residents and to work with planners to decrease household use of water resources and to better design water infrastructure and facilities.

7. Improve solid waste management.

- a. **Increase the volume of waste recycled, while simultaneously decreasing the amount of waste put into open-air dumps, incinerated, burned or disposed of into landfills.** There is a need to: (i) develop infrastructure and technologies that enable the use of waste to energy generation; (ii) promote sustainable material cycles via design control; and (iii) encourage residents and businesses to sort and recycle their solid waste.
- b. **Promote solutions that allow for the integration of waste management into water and energy management.** Initiatives aiming to optimize water consumption, reduce GHGs and energy consumption and decrease waste-processing costs should be promoted and scaled-up.

Additional sources

Economic and Social Commission for Asia and the Pacific (2020). Reviewing urbanization, resource flows, and environmental trends in Bishkek. Paper presented at the Inception and Data Collection workshop. Bishkek. February. Available at:

https://www.unescap.org/sites/default/files/Summary%20report_Urbanization%20and%20resource%20trends%20in%20Kyrgyzstan.pdf