MISSION REPORT

United Nations Mission to Arkadag City, Turkmenistan I 23 – 25 February 2023

Name of Staff Member	United Nations Human Settlements Programme (UN-Habitat)	**Ms. Katja Schaefer**, Inter-Regional Advisor for Eastern Europe and Central Asia at Programme Development Branch, Global Solutions Division **Mr. Herman Pienaar**, Head of Urban Lab at Planning, Finance and Economy Section, Urban Practices Branch, Global Solutions Division
	United Nations Environment Programme (UNEP)	**Ms. Kirstin Miller**, Executive Director, Ecocity Builders
	United Nations Industrial Development Organization (UNIDO)	**Mr. Farrukh Alimdjanov,** Industrial Development Officer, Division of Digital Transformation and AI Strategies, Technical Cooperation and Sustainable Industrial Development
	United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)	**Ms. Sanjeevani Dilanthi Singh**, Economic Affairs Officer, Sustainable Urban Development Section, Environment and Development Division
	United Nations Development Programme (UNDP)	**Mr. Atamuhamed Sariyev,** Energy Efficiency Specialist of the UNDP project "Sustainable Cities in Turkmenistan: Integrated Green Urban Development in Ashgabat and Avaza"
Type of Mission	Appraisal mission to Arkadag City, Turkmenistan	
Mission Area	Ashgabat and Arkadag Cities, Turkmenistan	
Mission Dates	(18) 23 – 25 February 2023	
Mission Objectives	1. Review of urban planning, implementation, and management of Arkadag City in line with national and local impact contributing to the localization of the New Urban Agenda (NUA) and the Sustainable Development Goals (SDG), particularly SDG11 on inclusive, safe, resilient, and sustainable Cities and Communities in Turkmenistan; 2. Observation of progress made, and approaches used for the incremental construction of Arkadag City, including the design, materials used and overall sustainability of the city within the framework of the people-centered smart city methodology applied; 3. Observation of the public sector's and entrepreneur ecosystem's efforts in establishing Arkadag as a Smart City and recommendations for enhancement in future development stages of the city as well as future urban development initiatives in the country, including those associated with the digital transformation and real-sector-related opportunities emerging from the adoption of digital and frontier technologies; 4. Documentation of potential good practices and conceptual/ technological solutions used in the city that contribute to its ambition of being a contemporary urban area with up to date "smart city" features; 5. Identification of areas for further enhancement of the Turkmenistan smart city approach, from the urban plan to its realization including critical components of urban policy, urban legislation, urban planning and design, urban finance as well as learning from the implementation of Arkadag City. Moreover, aspects of inclusive neighborhood approaches will be explored, housing and city infrastructure, environmental issues, financing, and elements of replicability across the country and within the sub-region; and 6. Provision of elements for a roadmap to implement the recommendations made during the technical mission.	

Mission Highlights, outcomes and next steps	**Meetings and main discussion points/ outcomes/ main takeaways**
	Tuesday, 21 February 2023:
	<u>Meeting with UNDSS @ UN-House in Ashgabat</u>
	Attendance: Plamen Skrobanski; Katja Schäfer and Herman Pienaar
	- UNDSS briefing
	<u>Meeting with UN RCO @ UN-House in Ashgabat</u>
	Attendance: Dmytro Shlapachenko, Chary Nurmuhammedov, Vladimir Valetka, Maksat Keshiyev; Katja Schäfer; Herman Pienaar and Atamuhamed Sariyev.
	- Briefing on request for appraisal mission and expected accomplishments
	- Planning of agenda for the week
	- Briefing and background information on the local context and culture in Turkmenistan
	- Discussion on potential recommendations and way forward from mission
	Wednesday, 22 February 2023:
	<u>Meeting with Deputy Minister of Foreign Affairs Ms. Byashimova, Deputy Minister, Ministry of Foreign Affairs @ UN-House in Ashgabat</u>
	Attendance: Turkmenistan United Nations Country Team and Resident Coordinator + Office; UN-Habitat mission members
	- Brief introduction of mandates and work conducted by different UN agencies to the newly appointed Deputy Minister of Foreign Affairs
	- Deputy Minister acknowledged the importance of sustainable development and the urban context
	Thursday, 23 February 2023:
	<u>Meeting with UN RCO @ UN-House in Ashgabat</u>
	Attendance: UN mission members (UN-Habitat, UNESCAP, UNIDO, UNEP, UNDP), UN RC + RCO staff
	- Briefing on request for appraisal mission and expected accomplishments
	- Planning of agenda for the week
	- Briefing and background information on the local context and culture in Turkmenistan
	- Discussion on potential recommendations and way forward from mission
	Thursday, 23 and Friday, 24 February 2023:
	<u>Site Visit Arkadag City</u>
	- See also separate report (Annex 2: Report – Key Findings and Recommendations)
	Saturday, 25 February 2023:
	<u>Meeting with MoFA and selected line ministries @ MoFA Ashgabat</u>
	Attendance: representatives from key ministries in Turkmenistan, led by Deputy Minister of Foreign Affairs Ms. Byashimova, Deputy Minister, Ministry of Foreign

Affairs; UN mission members
- Briefing of UN mission members to Turkmenistan public officials on the site visit in Arkadag and sharing of observations
- Presentation on contribution by various sector ministries to the UN mission to Arkadag city development
- Discussion on questions of clarification
- Agreement on next steps and suggestion for potential roadmap: (1) Invitation to Turkmenistan to attend 2nd UN-Habitat Assembly in June 2023 in Nairobi, Kenya; (2) UN-Habitat invitation to attend Arkadag City inauguration in summer 2023.

Meeting with RCO, debriefing
Attendance: UN mission members
- Debriefing on mission findings
- Discussion on drafting of recommendations from mission observations and issuance of agency dedicated "letters/ certificates of appreciation"
- Agreement on next steps and suggestion for potential roadmap on engagement with Turkmenistan to promote sustainable urbanization, including Conceptualization of Arkadag phase 2 and Ashgabat neighborhood developments.

Next steps and/or decision points
- Field mission of UN resident agencies to Arkadag City; consideration of drafting a joint recommendation report to the Government of Turkmenistan
- Development of Joint Mission Report for the Mission
- Development of joint Arkadag City Appraisal Report and Recommendations including concrete project proposals (titles) for Arkadag City Phase 2
- Issuance of agency specific certificates/ letter of appreciation/ recognition (based on the advice by specific entities)
- Development of roadmap for enhancing visibility of Turkmenistan
- Development of joint programme for Arkadag #2 and Ashgabat New City
- UN-Habitat and UNEP to collaborate on neighborhood approach building on the collaboration agreement signed at WUF 11 (UNEP City Unit Paris)
- UNIDO in coordination with UNRCO, UN-Habitat, UNESCAP, UNEP, UNDP, other interested sister institutions to develop a programme for capacity building and creating capabilities in the country to collect, analyze and put to dashboards evidence-supported and AI processed decision-facilitating data, new solutions for further smartification of urban management as well as other public or industry supporting services
- Joint events calendar and entry points for sharing of Turkmenistan good practice with UNESCAP (and UNECE)
- Support to preparation of Arkadag City launching event

Contacts

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- **UNODC:** Mr. Chary Atayev, Head of Office in Turkmenistan
- **WHO:** Mr. Egor Zaitsev, Resident Representative in Turkmenistan
- **UNICEF:** Mr. Mohammad Fayyazi, Representative in Turkmenistan
- **IOM:** Timur Dosmammedov, Head of Office (tdosmammedov@iom.net)
- **UNHCR** (online): Hans Friedrich Schodder, Representative for Central Asia
- **UNECE** (online): Polina Tarshis, Programme Management Officer; Mario Apostolov, Regional Adviser
- **UN OHCHR** (online): Fabio Piana, Representative for Central Asia a.i.

National Government:
- **MoFA:** Ms. Byashimova, Deputy Minister, Ministry of Foreign Affairs
- **MoFA:** Rovshen Annaberdiyev, Head of International Organizations Department (iod@mfa.gov.tm)
- **MoFA:** Akmyrat Rahymov, 3rd Secretary of the Ahal Regional Branch

Local Government:
- Mr. Orazov Derya, Head of Construction Directorateof Arkadag City
- Mr. Durdylyev Shamuhammet, Mayor of Arkadag City
- Mr. Irina Georgievna Grishta, Principal Architect

Attachments
- Annex 1: Concept Note – United Nations Mission to Arkadag City, Turkmenistan I 22 – 25 February 2023
    - o Annex 1.1: Background to Arkadag City
    - o Annex 1.2: Key Assessment Methodologies
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- Annex 3: Certificates

	o Annex 3.1: UN-Habitat o Annex 3.2: UNESCAP o Annex 3.3: UNEP o Annex 3.4: UNIDO **Media response** - MFA: https://www.mfa.gov.tm/en/news/3641 - Turkmenportal: https://turkmenportal.com/en/blog/58473/tehnicheskaya-missiya-oon-provela-ocenku-razvitiya-novogo-goroda-arkadag - Orient: https://orient.tm/en/post/47955/city-arkadag-was-visited-un-technical-mission-review-and-evaluation - https://unhabitat.org/news/07-mar-2023/un-habitat-leads-assessment-mission-to-turkmenistan - https://www.newscentralasia.net/2023/03/29/aarkadag-city-of-turkmenistan-global-prototype-of-a-sustainable-city/
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ANNEXES

ANNEX 1:   CONCEPT NOTE – UNITED NATIONS MISSION TO ARKADAG CITY, TURKMENISTAN I 23 – 25 FEBRUARY 2023

United Nations Mission to Arkadag City, Turkmenistan I 23 – 25 February 2023
CONCEPT NOTE

PURPOSE AND OBJECTIVES

The Government of Turkmenistan has initiated through the United Nations Resident Coordinator Office (UN RCO) in Ashgabat, Turkmenistan the request for a joint technical mission by the United Nations Development System (UNDS) based inside the country and respective non-resident agencies to visit, review and assess the new Arkadag city development based on their respective mandates. The objectives of the technical mission to Arkadag City will include:

- Review of urban planning, implementation and management of Arkadag City in line with national and local impact contributing to the localization of the New Urban Agenda (NUA) and the Sustainable Development Goals (SDG), particularly SDG11 on inclusive, safe, resilient and Sustainable Cities and Communities in Turkmenistan as well as SDG 9 on Industry, Innovation and Infrastructure;
- Observation of progress made and approaches used for the incremental construction of Arkadag City, including the design, materials used and overall sustainability of the city within the framework of the people-centered smart city methodology applied;
- Documentation of potential good practices and conceptual/ technological solutions used in the city that contribute to its ambition of being a contemporary urban area with up-to-date "smart city" features;
- Identification of areas for further enhancement of the Turkmenistan smart city approach, from the urban plan to its realization including critical components of urban policy, urban legislation, urban planning and design, urban finance as well as learning from the implementation of Arkadag City. Moreover, aspects of inclusive neighborhood approaches will be explored, housing and city infrastructure, environmental issues, potential for further innovations and digitalization projects, financing and elements of replicability across the country and within the sub-region; and
- Provision of elements for a roadmap to implement the recommendations made during the technical mission.

The participating UN agencies are expected to share the comprehensive findings of the technical mission and recommendations with the Government of Turkmenistan via the UN RCO. This initial mission will explore further joint initiatives between the Government of Turkmenistan and the United Nations Country Team (UNCT), including non-resident agencies, for Arkadag City and future ventures of similar nature, such as a smart city project for Ashgabat City.

ORGANIZERS

The technical mission is jointly organized by the Turkmenistan Ministry of Foreign Affairs and the United Nations Resident Coordinator's Office in Ashgabad, Turkmenistan.

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PARTICIPATING UN ORGANIZATIONS

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United Nations Environment Programme (UNEP):

- Ms. Kirstin Miller – Executive Director, Ecocity Builders (kirstin@ecocitybuilders.org)

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP):

- Ms. Sanjeevani Singh, Economic Affairs Officer, Sustainable Urban Development Section, Environment and Development Division, ESCAP (sanjeevani.singh@un.org)

[other UN agencies]

PROGRAMME OF THE MISSION

Date	Time	Activity	Location
23 February 2023	02:55	Arrival of mission delegates to Ashgabat International Airport, Turkmenistan */express PCR testing in airport/ transfer to the hotel*	Yyldyz Hotel in Ashgabat
	13:00 – 14:15	Prep-meeting of the UN Mission delegates	UN-House
	14:30 – 17:00	Visit to Arkadag City	Arkadag City
	17:30 – 18:30	Meeting between participating UN agencies (initial observations, questions of clarification)	UN House
	19:00	Dinner	Yyldyz Hotel
24 February 2023	09:30 – 12:00	Visit to Arkadag City (continued)	Arkadag City
	13:00 – 14:00	Lunch break	Yyldyz Hotel
	16:15 – 17:15	Debriefing Session with UN agencies	UN House
25 February 2025	9:45 – 12:30	Visit to National Museum and Carpet Museum	Ashgabat city
	13:00 – 14:30	Lunch break	

Date	Time	Activity	Location
	rest of the day	Sightseeing in Ashgabat	Ashgabat city
26 February 2025	02:15	Departure to Ashgabat International Airport from the hotel	

LOGISTICAL NOTE

Format of the Mission:

The technical mission will be conducted in person. Representatives of the UN agencies and organizations participating in this mission to Arkadag City are required to travel to Ashgabat, Turkmenistan.

Passports and visas:

UN LP holders do not require to obtain a visa prior to travelling to Turkmenistan. All other passport holders participants requiring visas to enter Turkmenistan must submit passport copies to the organizers well in advance. Within a few days of submitting, participants will receive an official letter of invitation, which allows obtaining a visa upon arrival at the airport in Ashgabat, Turkmenistan. The passport must be valid for over six (6) months.

For travelers requiring entry visa to Turkmenistan the cost of a single-entry visa is ranged between USD 20 to 135 based on the country of residence.

Local transportation:

Organizers will provide all local transportation related to the mission.

Expenses:

The Government of Turkmenistan will cover the following costs for a 2-member delegation of each participating UN agency, which is non-resident in Turkmenistan, for the mission dates from 23 to 25 February 2023. This includes: (1) International travel to and from Ashgabat; (2) Internal travel in Turkmenistan; (3) Hotel accommodation; (4) Lunch and dinner; and (5) Sightseeing program.

Accommodation:

Participants will be provided with a regular room in Yyldyz Hotel in Ashgabat including breakfast. Participants are responsible for paying other expenses, such as for local and long-distance telephone calls, business center use, laundry, room service and mini-bar items, as well as restaurant and bar services.

COVID testing requirements.

All citizens of foreign countries arriving in Turkmenistan must provide a document confirming that they have been fully vaccinated against COVID-19. The results of a PCR test taken within 48 hours before entering the country is to be presented at the border crossing points.

ANNEX 1.1: BACKGROUND TO ARKADAG CITY

The City of Arkadag is being conceptualized as a new administrative center of the Ahal velayat (region) of Turkmenistan. During the planning process and the first stages of the implementation, contemporary construction standards have been considered, including environmental standards, urban safety, and state-of-the-art technologies for urban management. The Government of Turkmenistan sees the city as a new model of urban culture in the country, conforming to the concept of the "smart city".

Figure 1: Master Plan of Arkadag City, 2022.

The city of Arkadag occupies a total area of 1,002 hectares and is designed for 64 thousand inhabitants. The number of residential buildings in the city is 368, which will host nearly 11,652 families/households. The construction has been carried out in two stages. The first stage includes 336 objects, among them buildings for public administration, science and research, social, educational, cultural, recreational and commercial infrastructure.

The territory of the city has been covered by high-speed Internet connectivity and during its operation, various e-services will be made available. To ensure uninterrupted functionality of digital systems and external communications, a total of 106.5 kilometers of fiber-optic communication lines have been laid.

Electric buses and electric taxis will run in the new city, and the Intelligent Transport System (ITS) has been implemented on the principle of "smart roads". One of its components will be the installation of "smart traffic lights", which is being introduced in Turkmenistan for the first time. This system will allow drivers to reduce travel time and avoid traffic jams. Complementing this concept are bus stops equipped with a digital system. Furthermore, modern complex for vehicles, and electric charging stations, to equip road lights with energy-efficient diode lamps, etc. are planned.

To determine the direction of movement in the city by persons with visual impairment, tactile ground indicators (TGI) are installed on the sidewalks, which are one of the necessary means for their social inclusion. The total length of the TGIs installed on the sidewalks of roads and in park areas is about 130 km. The use of sound signals and tactile signs at pedestrian traffic lights significantly increases the ability of people with visual impairment to move independently and safely in the city.

Elevators for various purposes are installed in many buildings of Arkadag city, the total number of which exceeds 1000 units. Elevators are equipped with an intercom system.

For the recreation of the city residents, it is planned to build a "health park", which will include areas for outdoor activities, running and cycling paths (with a total length of 14 km), and summerhouses for board games.

Currently, the construction of 4 secondary schools for 720 places each, 10 kindergartens, the International Horse Breeding Academy, Ahal velayat pedagogical and medical secondary vocational schools, and a 7-story 28-apartment residential building is nearing completion.

The Smart Home software will allow residents to monitor energy consumption and receive notifications of accidents. A general control system installed in each apartment will allow residents to track and regulate the condition of their homes. There are Energy Resources Automatic Control and Management Systems, methane leak sensors, water leak sensors, valves that block gas, and water controllers.

IT solutions will be introduced in all city educational institutions, including an e-school system, an e-library, and an online exam system.

Two hundred fifty-nine kilometers long internal network is being built. An optical fiber network will be connected to every home and institution, allowing simultaneous use of high-speed internet, IP TV, and a telephone system. A set of 4G devices was installed and connected , making it possible to use 3G and high-speed internet.

A Wi-Fi area will be created in the central park, and an electronic document management system will be introduced in institutions and enterprises. The public services portal e.gov.tm, will include a special section for Arkadag city.

Environmental aspects were considered in the road and communal infrastructure design and construction. For example, a drainage system is installed to lower the groundwater level. The water is then collected and fed into the settling tanks, which will further reuse it for watering the city's green spaces. This innovation will allow the saving of water resources, particularly the water intake from the Garagum River.

An intelligent 24-hour video surveillance system with automatic face recognition, license plates scanning, visual analysis of emergency situations will be introduced in the city to ensure security around residential buildings, institutions, on streets and roads.

Currently, preparations are underway for the formal opening of Arkadag city.

In the coming weeks and months, a landscaping campaign will take place in the city on the area of 288 hectares.

ANNEX 1.2: KEY ASSESSMENT METHODOLOGIES

- Sustainable Development Goals (https://sdgs.un.org/goals)

- New Urban Agenda (https://habitat3.org/the-new-urban-agenda/)

- Sustainable Development Cooperation Framework between the Government of Turkmenistan and United Nations 2021-2025 (https://turkmenistan.un.org/sites/default/files/2021-08/TKM-UNSDCF%202021-25%20Eng%20web.pdf)

- Country SDG Profile – Turkmenistan (https://data.unescap.org/stories/country-sdg-profile-turkmenistan?_gl=1*hdx0da*_ga*NjY4MDY0ODAwLjE2NzUwODQyMzE.*_ga_SB1ZX36Y86*MTY3NTA4NDIzMS4xLjEuMTY3NTA4NDMyOS4zMC4wLjA.)

- UN System-Wide Strategy for Sustainable Urban Development (https://unhabitat.org/un-system-wide-strategy-on-sustainable-urban-development)

- Global Urban Monitoring Framework (https://unhabitat.org/sites/default/files/2022/08/the_global_urban_monitoring_framework_metadata.pdf)

- People-Centered Smart Cities (https://unhabitat.org/programme/people-centered-smart-cities/people-centered-smart-cities-playbooks): (1) Centering People in Smart Cities; (2) Assessing the Digital Divide; (3) Addressing the Digital Divide; (4) Shaping Co-creation and Collaboration in Smart Cities - A playbook for local and regional governments; (5) Building and securing digital public infrastructure – A playbook for local and regional governments; and (6) Building Capacity for People-Centered Smart Cities - A playbook for local and regional governments.

ANNEX 1.3: UN AGENCIES PARTICIPATING IN THE MISSION

The United Nations Human Settlements Programme (UN-Habitat) is mandated by the UN General Assembly to promote socially and environmentally sustainable towns and cities. UN-Habitat is the focal point for all urbanization and human settlement matters within the UN system.

UN-Habitat works with partners to build inclusive, safe, resilient and sustainable cities and communities. UN-Habitat promotes urbanization as a positive transformative force for people and communities, reducing inequality, discrimination and poverty.

UN-Habitat works in over 90 countries to promote transformative change in cities and human settlements through knowledge, policy advice, technical assistance and collaborative action.

UN-Habitat's strategic plan 2020-2023 adopts a more strategic and integrated approach to solving the challenges and opportunities of twenty-first century cities and other human settlements. UN-Habitat's mission embodies the four main roles of the organization, which can be summarized as: think, do, share, and partner.

UNIDO is the specialized agency of the United Nations with a unique mandate to promote and accelerate sustainable industrial development.

UNIDO plays a crucial role in accelerating the achievement of Sustainable Development Goal 9, along with all other industry-related goals of the 2030 Agenda.

First established in 1966 and transformed into a specialized UN agency in 1985, UNIDO's 171 Member States guide the Organization through the Policymaking organs. The Lima Declaration of 2013 and the Abu Dhabi Declaration of 2019 are recent milestone declarations that reaffirm the Organization's mandate.

The UNIDO Secretariat is currently composed of approximately 680 staff members, as well as 1,700 consultants from 135 countries.

In addition to its headquarters in Vienna, Austria, UNIDO has liaison offices in Brussels, Geneva and New York. The UNIDO field network consists of 48 regional and country offices. UNIDO also maintains ten Investment and Technology Promotion Offices.

UNIDO provides its support through four mandated functions: technical cooperation; action-oriented research and policy-advisory services; normative standards-related activities; and fostering partnerships for knowledge and technology transfer.

UNIDO recognizes the role of sustainable industrial development in achieving gender equality and the economic empowerment of women.

Since its inception in 1972, the United Nations Environment Programme (UNEP) has been the global authority that sets the environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the UN system and serves as an authoritative advocate for the global environment.

UNEP's mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

UNEP works on delivering transformational change for people and nature by drilling down on the root causes of the three planetary crises of climate change, nature and biodiversity loss, and pollution and waste. UNEP employs seven interlinked subprogrammes for action: Climate Action, Chemicals and Pollutions Action, Nature Action, Science Policy, Environmental Governance, Finance and Economic Transformations and Digital Transformations.

Through its campaigns, particularly World Environment Day, UNEP raises awareness and advocates for effective environmental action.

Headquartered in Nairobi, Kenya, UNEP works through its divisions as well as regional, liaison and out-posted offices and a growing network of collaborating centres of excellence.

UNEP works closely with its 193 Member States and representatives from civil society, businesses, and other major groups and stakeholders to address environmental challenges through the UN Environment Assembly, the world's highest-level decision-making body on the environment.

The organization hosts the secretariats of many critical multilateral environmental agreements and research bodies.

The Economic and Social Commission for Asia and the Pacific (ESCAP) is the most inclusive intergovernmental platform in the Asia-Pacific region. The Commission promotes cooperation among its 53 member States and 9 associate members in pursuit of solutions to sustainable development challenges. ESCAP is one of the five regional commissions of the United Nations.

The ESCAP secretariat supports inclusive, resilient and sustainable development in the region by generating action-oriented knowledge, and by providing technical assistance and capacity-building services in support of national development objectives, regional agreements and the implementation of the 2030 Agenda for Sustainable Development. ESCAP also provides support to partners at the national level. ESCAP's national offer is rooted in and linked with the implementation of global and regional intergovernmental frameworks, agreements, and other instruments.

ESCAP pursues this objective by carrying out work, in close cooperation with other United Nations entities and intergovernmental organizations in the region, in the following areas: Macroeconomic Policy and Financing for Development; Trade, Investment & Innovation; Transport; Environment and Development; ICT and Disaster Risk Reduction; Social Development; Statistics; and Energy.

ANNEX 2:   REPORT – KEY FINDINGS AND RECOMMENDATIONS

United Nations Mission to Arkadag City, Turkmenistan I 23 – 25 February 2023
REPORT - KEY FINDINGS AND RECOMMENDATIONS

1. Background

1.1. Mission Background

From 23 – 25 February 2023, a Joint United Nations (UN) mission was conducted to Ashgabat and Arkadag Cities in Turkmenistan. Facilitated by the Turkmenistan Ministry of Foreign Affairs and supported by the UN Resident Coordinator Office in Ashgabat, the mission comprised of representatives of UN entities both resident and non-resident in the country. Under the overall stewardship of the United Nations Human Settlements Programme (UN-Habitat), the United Nations Environment Programme (UNEP), United Nations Industrial Development Organization (UNIDO) and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) technically contributed to this mission as well as the United Nations Development Programme (UNDP) based in Ashgabat, Turkmenistan.

The main objective of the mission was to review of urban planning, implementation, and management of Arkadag City in line with national and local impact contributing to the localization of the New Urban Agenda (NUA) and the Sustainable Development Goals (SDG), particularly SDG11 on inclusive, safe, resilient, and sustainable cities and communities in Turkmenistan. Moreover, observations on the progress made, and approaches used for the incremental construction of Arkadag City, including design, materials used, digital transformation and application of human-oriented, enabling and inclusive state-of-the art technologies, and overall sustainability of the city within the framework of the people-centered smart city methodology were applied. The initial documentation of potential good practices and conceptual/technological solutions used in Arkadag City that contribute to its ambition of being a contemporary urban area with up to date "smart city" features was discussed as well as areas for further enhancement of the Turkmenistan smart city approach identified, from the urban plan to its realization including critical components of urban policy, urban legislation, urban planning and design, urban finance, aspects associated with the digital transformation, as well as learning from the implementation of Arkadag City. Aspects of inclusive neighborhood approaches have been explored, in addition to housing and city infrastructure, environmental issues, real-sector-related opportunities emerging from the adoption of digital and frontier technologies, financing, and elements of replicability across the country and within the sub-region. In conclusion, a roadmap to implement the recommendations made during the technical mission has been outlined.

1.2. Conceptual framework

The 2030 Sustainable Development Agenda[1] adopted in 2015 has highlighted inclusive, safe, resilient and sustainable urbanization in a targeted Sustainable Development Goal (SDG) 11[2]. The importance of SDG11 and other SDGs at local level is further highlighted in the New Urban Agenda (NUA)[3] that has been adopted by member states in 2016.

In March 2022, the Global Urban Monitoring Framework (UMF)[4] was endorsed by the UN Statistical Commission for monitoring the SDG and NUA implementation alongside other regional, national, and

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[1] https://sdgs.un.org/2030agenda

[2] https://www.un.org/sustainabledevelopment/cities/

[3] https://habitat3.org/the-new-urban-agenda/

[4] https://data.unhabitat.org/pages/urban-monitoring-framework

subnational urban programs. It harmonizes existing urban indices and tools, including the widely implemented City Prosperity Index (CPI)[5]. The framework aims at ensuring thematic integration and inter-linkages among various dimensions of development, disaggregation of data, and inclusion of groups that are traditionally excluded. It promotes working at different scales and functional urban areas, including ecological functional areas, enabling city comparability, and the possibility of more in-depth policy analysis.
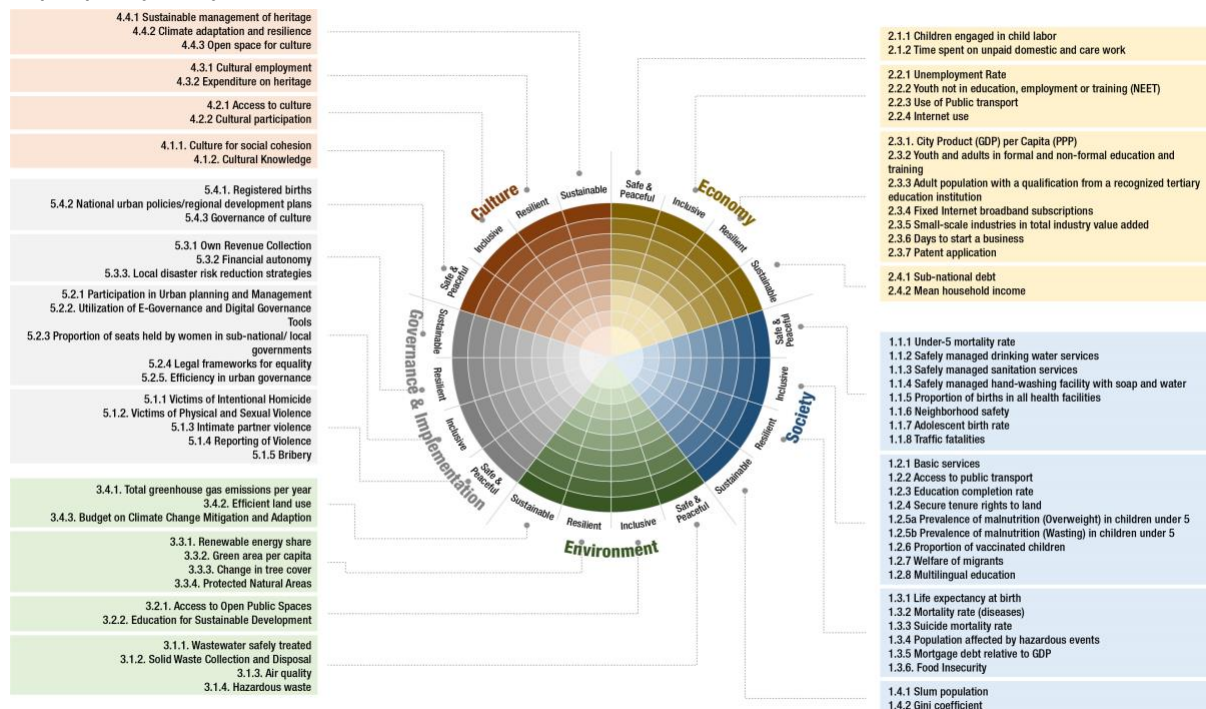

The labels around the wheel diagram are:

Culture
4.4.1 Sustainable management of heritage
4.4.2 Climate adaptation and resilience
4.4.3 Open space for culture

4.3.1 Cultural employment
4.3.2 Expenditure on heritage

4.2.1 Access to culture
4.2.2 Cultural participation

4.1.1. Culture for social cohesion
4.1.2. Cultural Knowledge

Governance & Implementation
5.4.1. Registered births
5.4.2 National urban policies/regional development plans
5.4.3 Governance of culture

5.3.1 Own Revenue Collection
5.3.2 Financial autonomy
5.3.3. Local disaster risk reduction strategies

5.2.1 Participation in Urban planning and Management
5.2.2. Utilization of E-Governance and Digital Governance Tools
5.2.3 Proportion of seats held by women in sub-national/ local governments
5.2.4 Legal frameworks for equality
5.2.5. Efficiency in urban governance

5.1.1 Victims of Intentional Homicide
5.1.2. Victims of Physical and Sexual Violence
5.1.3 Intimate partner violence
5.1.4 Reporting of Violence
5.1.5 Bribery

Environment
3.4.1. Total greenhouse gas emissions per year
3.4.2. Efficient land use
3.4.3. Budget on Climate Change Mitigation and Adaption

3.3.1. Renewable energy share
3.3.2. Green area per capita
3.3.3. Change in tree cover
3.3.4. Protected Natural Areas

3.2.1. Access to Open Public Spaces
3.2.2. Education for Sustainable Development

3.1.1. Wastewater safely treated
3.1.2. Solid Waste Collection and Disposal
3.1.3. Air quality
3.1.4. Hazardous waste

Economy
2.1.1 Children engaged in child labor
2.1.2 Time spent on unpaid domestic and care work

2.2.1 Unemployment Rate
2.2.2 Youth not in education, employment or training (NEET)
2.2.3 Use of Public transport
2.2.4 Internet use

2.3.1. City Product (GDP) per Capita (PPP)
2.3.2 Youth and adults in formal and non-formal education and training
2.3.3 Adult population with a qualification from a recognized tertiary education institution
2.3.4 Fixed Internet broadband subscriptions
2.3.5 Small-scale industries in total industry value added
2.3.6 Days to start a business
2.3.7 Patent application

2.4.1 Sub-national debt
2.4.2 Mean household income

Society
1.1.1 Under-5 mortality rate
1.1.2 Safely managed drinking water services
1.1.3 Safely managed sanitation services
1.1.4 Safely managed hand-washing facility with soap and water
1.1.5 Proportion of births in all health facilities
1.1.6 Neighborhood safety
1.1.7 Adolescent birth rate
1.1.8 Traffic fatalities

1.2.1 Basic services
1.2.2 Access to public transport
1.2.3 Education completion rate
1.2.4 Secure tenure rights to land
1.2.5a Prevalence of malnutrition (Overweight) in children under 5
1.2.5b Prevalence of malnutrition (Wasting) in children under 5
1.2.6 Proportion of vaccinated children
1.2.7 Welfare of migrants
1.2.8 Multilingual education

1.3.1 Life expectancy at birth
1.3.2 Mortality rate (diseases)
1.3.3 Suicide mortality rate
1.3.4 Population affected by hazardous events
1.3.5 Mortgage debt relative to GDP
1.3.6. Food Insecurity

1.4.1 Slum population
1.4.2 Gini coefficient

Figure 1: The Urban Monitoring Framework (UMF) Wheel Diagram

The UMF also serves as a monitoring tool for UN-Habitat's SDG Cities Flagship Programme and supports reporting through the Voluntary Local Reviews (VLRs) and the preparation of urban data for the UN Common Country Assessments. It comprises of a set of metrics that guide stakeholders to evaluate progress of cities and urban areas by indicators, domains, city objectives, and against other cities globally.

The Joint UN Mission to Arkadag City has been observing the visioning for a new city of state significance[6], the progress of planning and implementation were witnessed during the field mission. While keeping the overall targets of achieving the localization of SDGs and NUA in Arkadag City, attention was paid particularly to the elements of creating sustainable neighborhoods and communities in the newly established city.

- Considerations for sustainable urbanization at **national level:**

At National Level, the overall framing of the mission took into consideration key elements of the Action Framework for the NUA implementation. These include (1) National Urban Policy; (2) urban legislation, rules and regulations; (3) urban planning and design; (4) urban economy and municipal finance; and (5) local implementation.

- Considerations for sustainable urbanization at **regional and city level**:

At regional and city level, particular attention of the joint UN mission was on understanding the elements of city prosperity, including (1) environmental sustainability; (2) infrastructure; (3) productivity; (4) equity and social inclusion; and (5) quality of life. Moreover, an initial understanding on governmental institutions engaged in the planning, implementation, monitoring for evidence-based decision making and governance/ management of Arkadag City was discussed within the framework of understanding urban legislation as well as other policy and legal backgrounds.

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[5] https://data.unhabitat.org/pages/city-prosperity-index
[6] As per the Law on Arkadag City

- Considerations for sustainable urbanization at **neighborhood level**:

The joint UN mission explored the application of key principles of sustainable neighborhoods applied in Arkadag City, including (1) adequate space for streets and an efficient street network; (2) appropriate densities; (3) mixed land-use; (4) social mix; and (5) limited land-use specialization.

- Considerations for sustainable urbanization at **household level**:

The concept of people-centered smart cities has been explored also at household level, including the application of frontier technologies for enhanced evidence-generation, monitoring and management of the building stock as well as the neighborhood and city levels.

2. Overall Observations

The scope of the mission has been of observatory nature and did not assess each indicator of the Urban Monitoring Framework in detail. **However, the mission acknowledged and appreciated the efforts made towards implementing the principles of inclusive, safe, resilient, and smart sustainable neighborhoods and communities, hereby contributing to localizing Sustainable Development Goals and the New Urban Agenda** in Turkmenistan, and in the new city of Arkadag in particular.

2.1. General observations

Arkadag City is the first and one of its kind new city developments in Turkmenistan and plans for further developments are laid out, including the expansion of the capital city of Ashgabat. It has been conceptualized for 64,000 inhabitants with the aim of becoming a sustainable and livable urban environment and the new capital city for Ahal region. The city's planning, implementation, and management have been designed with a view toward contributing to the integration, localization, and implementation of the New Urban Agenda and Sustainable Development Goals (SDGs) alongside the creation of an innovative and people-centred smart city.

The planning of Arkadag City has been guided by principles of sustainable development, including the incorporation of green spaces, pedestrian-friendly infrastructure, and mixed-use zoning. The city's layout prioritizes mobility, with a network of roads designed to facilitate easy access in the city and to the surrounding areas.

In terms of implementation, the construction of Arkadag City has been supported by the Turkmenistan government, which has provided significant funding and resources for the project. The city has been designed to accommodate a population of 64,000 inhabitants, with a range of housing options available for citizens across a range of income statuses. This includes apartments, townhouses, detached homes, and affordable housing options, which is highly commendable.

To ensure the successful management of Arkadag City, the government has established dedicated administrative bodies both at national and local levels to oversee its development and operation. The city's management strategy includes a focus on environmental sustainability, with programs in place to promote waste reduction, energy conservation, and water efficiency. The city is also home to a range of community facilities, including schools, hospitals, libraries, theatres, and public parks, designed to promote social cohesion and community well-being and meet the required targets and indicators in the SDGs.

In terms of the national and local impact of Arkadag City, the project is seen as a flagship initiative for sustainable urban development in Turkmenistan. The city's planning and implementation align with national goals for economic development and urban renewal, while its commitment to sustainable practices contributes to the localization of the New Urban Agenda and SDGs.

Overall, the planning, implementation, and management of Arkadag City reflect a commitment to sustainable urban development and provide a model for other cities looking to incorporate environmentally friendly practices into their planning and operation. While it is still early days for the city, the project holds promise as a potential model for sustainable urban development in the region and beyond.

During two field visits and deliberations by representatives from sector ministries facilitated by the Ministry of Foreign Affairs, the mission was not only able to learn about the planning and implementation process of Arkadag City. It was also able to observe the ongoing construction works,

assess major infrastructure, public spaces, recreational facilities and road networks in the making, visit a variety of neighborhoods and housing solutions, schools, hospitals, libraries, playgrounds, and other public buildings. The mission paid particular attention to assessing respective urban innovations and smart solutions applied in Arkadag City. As the construction works are being finalized and the equipping of public buildings is ongoing, smart applications were demonstrated and the plans for populating the city and the provision of services as well as stimulation of job opportunities for residents deliberated. The mission was not able to talk to future residents of Arkadag city, hence the assessment of the sustainability of the city remains to be assessed at a later stage once the city has been inaugurated and populated for a substantive period.

2.2. Environment

The selection of the location for Arkadag City in the center of Ahal region was well-studied, with consideration given to various aspects such as air circulation facilitated by a nearby mountain range to improve air quality and natural cooling during hot summers, access to clean and safe water, views into surrounding environmentally protected areas, a mountain range, and agricultural fields providing a green belt to Arkadag City. The strategic integration into a system of neighboring towns, villages, and communities, as well as proximity to employment opportunities and the capital city of Ashgabat, are supported by well-planned connectivity provided by resilient infrastructure corridors.

An assessment was carried out to identify and analyze the climatic conditions of the site. This involved examining a range of factors, including natural resources like sun and wind potential, natural constraints such as topography, rivers, parks, forests, wetlands, and agricultural requirements, as well as water availability, including rainwater, underground water, water bodies, and running water, along with soil characteristics.

In the planning process, various factors were taken into consideration, including environmental and other threats and risk areas, main access points and infrastructure corridors. The planning also emphasized energy efficiency, clean production, water, sanitation, waste, building materials, resilience, disaster preparedness, and public spaces to promote fresh air circulation. Furthermore, earthquake resilient building codes were implemented to ensure the city's resilience to natural disasters.

Environmental and other threats and risk areas, main access points to the city and infrastructure, and legal restrictions were considered in the planning process. The planning also included a focus on energy efficiency, clean production, water, sanitation, waste, material, resilience, disaster preparedness, and public spaces to promote fresh air. Furthermore, protected natural areas were considered and natural heritage sites. As Turkmenistan's biodiversity is threatened by factors such as habitat loss, degradation, and climate change, efforts were made in the planning and execution of Arkadag City to protect and conserve green spaces in and surrounding the city.

2.3. Society

In the planning of Arkadag city, the social dimensions of sustainable urban development were considered, including inclusivity and equity, diversity and cultural heritage, health and well-being, safety and security, education, and lifelong learning. These dimensions involve ensuring access to resources, celebrating diversity, promoting well-being, and providing safety.

During the field visit, the mission was unable to observe the interaction between residents and the built environment as the city's population was still being planned and the settling-in process ongoing. The mission, however, was able to visit different neighborhoods, schools, libraries, theatre and health facilities, and observe the provision of basic urban services, which were executed using the latest technical standards and enhanced by smart technology solutions. The city's planning and execution process considers the provision of accessibility for all, with a particular focus on persons with disabilities.

The mission observed that urban environments promoting physical, mental, and social well-being for all residents were created, through access to healthcare, green spaces, and safe neighborhoods. Moreover, the access to quality education and lifelong learning opportunities for all residents were discussed, to support personal and professional development and increase social mobility.

For the upcoming period, it is crucial to involve and engage residents and stakeholders in the planning and decision-making process as well as the process of appropriating the city and neighborhoods. It is vital that all voices are heard and that they have a stake in the development of their communities. This includes giving special attention to groups such as children, youth, women, elderly individuals, persons with disabilities, and others who may require additional support. It is also important to recognize and celebrate the diversity of Turkmen cultures and traditions and integrate them into urban development practices. This will help shape new histories within the community while preserving and promoting sustainable development and define the identity of Arkadag City.

2.4. Economy

The mission was not able to observe to the full extent all building blocks towards sustainable urban economy in the city of Arkadag and its hinterland. However, observations were made with regards to considerations towards this end.

Arkadag city provides the base for a diverse range of industries and economic activities. The Government of Turkmenistan embraces innovative solutions and explores initial steps towards entrepreneurship to attract investment and create jobs. Adequate infrastructure, such as transportation, utilities, and communication systems, are in place and provide an essential base for economic growth and development.

During the mission, the importance of human capital in Arkadag City was discussed with local and national stakeholders, recognizing that the skills and education of the population are crucial for creating, attracting, and retaining businesses and industries. Aspirations for an improved quality of life for all residents were also highlighted, including access to cultural amenities, recreational opportunities, and a safe and clean environment. This can attract and retain a talented workforce. The city has also taken steps towards sustainable economic development by using renewable resources and minimizing environmental impacts, which are important for its long-term health and prosperity of Arkadag City's urban economy. To foster economic growth and development, it is essential to have cooperation and partnerships between the public and private sectors, civil society organizations, and other stakeholders.

The planning and execution of Arkadag City incorporated the principle of innovation and smart technologies, potentially leading to efficient urban management. Smart technologies assist cities manage resources more efficiently, such as reducing energy consumption, optimizing waste management, and improving transportation systems. By embracing innovation and smart technologies, Arkadag City can create new economic opportunities, attract investment, and enhance the overall competitiveness. Furthermore, the promotion of innovation and smart technologies may contribute to the development of a knowledge-based economy, creating high-value jobs and promoting sustainable economic growth.

2.5. Alignment with principles for sustainable neighborhoods

While conducting the field visit, the mission participants observed the planning and implementation of Arkadag City, with particular attention given to the achievements made in creating sustainable neighborhoods. The sustainable neighborhoods incorporate key features such as sufficient street space and efficient street networks, appropriate building densities, mixed land-use to allow for economic use in any neighborhood, social diversity, and the availability of houses in various price ranges and tenures to accommodate different income groups. Additionally, the specialization of land-use in the neighborhoods was observed. The assessment was based on observation and not supported by empirical analysis to verify the findings.

2.5.1. Layout of the built-up areas

The development of Arkadag City emphasizes the promotion of proximity and walkability in a compact urban form, and the permeability of the urban fabric is suitable. Higher density neighborhoods are implemented to curb urban sprawl. The density of the entire Arkadag City development is 64 people/ha, and the residential neighborhoods reach densities of 94 to 105 people/ha. This compares relatively well with the international standard of 150 people/ha. It is important to consider the local context and culture when applying density standards. Climate-responsive design and hazard mitigation are incorporated for resilience to natural hazards. The aim is to promote sustainable, socially equal, and

thriving communities in economically viable ways, with increased walkability, reduced car dependency and optimized land use. An interconnected street network facilitates safe, efficient, and pleasant walking, cycling, driving and provides adequate space for an effective urban mobility scheme. The provision of local employment, production, consumption, a hierarchy of streets, and a variety of plot sizes and housing typology catering to diverse needs are also prioritized, at densities which can ultimately support the provision of neighborhood level local services.

2.5.2. Buildings

The two key aspects of urban development were observed. Density and its distribution across the allocated land for Arkadag City includes the design of the street network layout and building typologies. Additionally, while there are different housing typologies available, the variety of housing and building typologies is limited.

2.5.3. Open spaces

The design of Arkadag City incorporates a balanced provision of public spaces that serve various functions, including parks and green spaces for recreation, pedestrian zones and plazas for social interaction, and public squares for civic and cultural events. The development also includes linear parks and bike paths for active transportation, public transportation hubs for accessible mobility and recreational activities. The implementation of these various public space typologies promotes sustainable urban development, enhances the quality of life, provides economic opportunities, promotes social inclusion, and fosters community cohesion.

2.5.4. Mobility networks

The provision of safe and convenient infrastructure for walking and cycling is a positive feature in the overall design of the city, including street lighting and universal access. Additionally, the integration of public transport within walking distance is commendable.

2.5.5. Considerations for sustainable neighborhoods

The "My Neighbourhood Guidelines"[7], for sustainable neighborhoods suggest that mixed-use buildings are essential for promoting spill-over activities to the public realm, but opportunities for mixed-use are limited in Arkadag City. There is room for improvement in the fine-grain integration of public space for the neighborhood to increase permeability. Land design inefficiencies should be addressed to align with the global standard of 150 people/ha for sustainable neighborhoods, particularly with regards to parking spaces and overprovision of road space. The active interface with buildings and activated street frontage could be enhanced by creating spaces adjacent to streets with diverse uses to foster a pedestrian and cycling-friendly environment. Public spaces and parks have the potential to be multi-functional and should provide a range of activities. Additionally, there should be a variety of housing options and building typologies available.

2.6. Observations on context specific urban innovation and smart city approaches in Turkmenistan

Turkmenistan has shown strong interest in developing smart cities, with a focus on integrating technology to improve the efficiency of city services and infrastructure. Arkadag City, which is still under development, is aspiring to become a smart city that incorporates advanced technology for the benefit of its residents. The city is being built from scratch, providing a unique opportunity to integrate new technologies and design innovative urban solutions.

Arkadag (Smart) City demonstrated outstanding efforts of the public sector and local entrepreneurs in development and implementation of an inclusive, people-centered and sustainable Smart City using state-of-the-art digital technologies incorporating all aspects of the Forth Industrial Revolution for infrastructural, environmental and economic development.

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[7] https://unhabitat.org/sites/default/files/2023/05/my_neighbourhood_publication_1_1.pdf

The urban design of the city under consideration reflects sustainable principles, incorporating green spaces and promoting alternative modes of transportation such as cycling. Nevertheless, there remains room for improvement in terms of design solutions, including opportunities for mixed-use development and the provision of a variety of housing typologies. Furthermore, the design falls short of global standards for sustainable neighborhoods, with certain inefficiencies in land use that could be addressed.

3. Reflections for Consideration

The mission has proposed a set of recommendations for the Government of Turkmenistan to consider in order to achieve sustainable urbanisation, reflecting on the building blocks outlined in the New Urban Agenda. It is noted that some of the recommendations may already be in place in the country.

a. It is recommended that Turkmenistan advances a **National Urbanisation Policy**, which includes an assessment of medium and long-term urban demographic projections and trends, alignment of national urbanisation policy with development plans and strategies, establishment of a national system of cities and settlements, and adoption of a framework to reduce urban and territorial disparities. This framework should include defining the roles and responsibilities of all levels of government and local authorities in regards to urbanisation, urban planning, and management. Additionally, regulations should be established for land sustainability for urbanisation, as well as environmental and cultural heritage protection and disaster risk reduction.

b. It is recommended to update **urban legislation, rules, and regulations**. This involves defining the rights and responsibilities associated with urban land and enacting effective laws for the acquisition and protection of public space. Additionally, urban development should be regulated and a legal framework should be established to strengthen the capacity of national, sub-national, and local governments and ensures appropriate fiscal, political and administrative decentralization based on the principle of subsidiarity. Equitable and legal instruments should also be developed to capture and share the increase in land and property value generated by urban development processes, infrastructure projects and public investments, ensuring that these do not result in unsustainable land use and consumption.

c. Adjustments need to be made to the current **urban planning and design principles**. This involves establishing a participatory planning process, defining urban areas and natural protection zones, promoting sustainable density and mixed-use development, effectively using urban design, preserving natural resources and cultural heritage, promoting inclusive neighbourhoods through housing, and providing adequate space for economic activities.

d. It is recommended to mainstream **urban economy and municipal finance**. This can be done by establishing principles for enhancing the role of local government in fostering inclusive, equitable and sustainable urban development, improving tax policy and revenue generation, and designing tools for fostering inclusive local economic development. Additionally, it is important to ensure social, economic and safe physical access to quality basic services by all and to support community-led initiatives in service delivery. Local authorities should also adapt their economic development policies, mechanisms and financing models to promote access to affordable housing options.

e. To enhance sustainable urbanization practices in Turkmenistan, it is recommended to learn from the planning and **local implementation** of Arkadag city. This includes identifying good practices to share with other cities and communities locally, regionally, and globally. Tools should be used to proactively address unbuilt urban growth, regenerate derelict or obsolete areas, plan for urban infill, and control land price speculation. Integrated, efficient, and equitable urban service frameworks should be provided, particularly in unplanned built urban areas. Instruments for public benefit from public investment, such as land value capture and sharing, and ecosystem services assessment and valuation, should be employed. Additionally, community-led groups should be established and supported to liaise between citizens and government and engage local communities in planning and implementing urban initiatives.

4. Recommendations/ Next Steps

4.1. General Recommendations

- *Prioritize Sustainable Development:* Arkadag City should prioritize sustainable development, with a focus on reducing greenhouse gas emissions and promoting resource efficiency. This can be achieved by incorporating green building practices, such as the use of energy-efficient materials and the integration of renewable energy sources, especially in the second phase of development for the city.

- *Sustainable Mobility:* The city's transportation infrastructure should prioritize sustainable mobility, with a focus on public transportation, cycling, and walking. Intelligent transportation systems have been implemented to optimize traffic flow and reduce congestion, while also promoting the use of electric vehicles and the development of charging infrastructure is encouraged.

- *Participatory Planning:* Citizen engagement and participation should be a key element of the planning process for Arkadag City. Citizens should be encouraged to provide feedback and ideas for the development of the city, with a focus on promoting transparency and accountability. Conducting a Voluntary Local Review (VLR) for Arkadag is recommended. A VLR can provide a mechanism for local governments and stakeholders to work together, measure progress, build accountability, and identify and address any challenges facing the city.

- *Partnerships and Collaboration:* Arkadag City should engage in partnerships and collaborations with other cities and stakeholders to promote regional and global sustainable urban development. This can include partnerships with other cities to share best practices and promote knowledge exchange, as well as collaborations with the private sector to develop sustainable infrastructure and services.

- Overall, by prioritizing sustainable development, promoting sustainable mobility, ensuring inclusive and equitable development, engaging citizens in the planning process, leveraging smart city technologies, and engaging in partnerships and collaborations, Arkadag City can align with the New Urban Agenda and Sustainable Development Goals, particularly Goal 11: Sustainable Cities and Communities.

4.2. Global Dimension

- Document and prepare good practices emerging from Arkadag City, building on the Urban Monitoring Framework (and other relevant urban indicator sets, as applicable);

- Share Arkadag City vision, strategy and implementation as a potential good practice in sub-region and globally (within SDG and NUA frameworks); and

- Preparation of a Voluntary Local Review (VLR) for Arkadag City, and mainstream urbanization in Voluntary National Review (VNR).

- Turkmenistan to attend the 2024 12th Session of the World Urban Forum in Cairo, Egypt.

4.3. (Sub)regional Dimension

- Share Arkadag City experience at technical discissions at sub-regional and regional events

4.4. National Dimension

- United Nations Country Team (both resident and non-resident agencies (led by UN-Habitat) stands ready to technically support the development of Arkadag City Phase Two and New Ashgabat City, maximizing synergies and avoiding duplication of efforts;

- Review relevant national housing and urban policies as well as relevant legislation in line with the implementation of the urban dimension of the SDGs, NUA and other global commitments; provide recommendations for adjustment towards better performance management for more inclusive, safe, resilient, and sustainable cities and communities in Turkmenistan; and

- Together with relevant line ministries, outline technical support package to the government of Turkmenistan in support of localizing SDGs, NUA and other relevant global commitments.

- Organization of a National Urban Forum in Turkmenistan, with Arkadag City hosting the first session.

4.5. Local Dimension

- Following the Arkadag City Phase One launching and individual households moving into the new housing, accompany a neighborhood-based approach to support the creation of communities and appropriation of space;
- Explore with local schools the possibility of curricula-based engagement at neighborhood and city level to make the city friendlier, accessible and safer for all;
- Greening of neighborhoods in a participatory manner by applying of principles for enhancing biodiversity; and
- Explore local economic development means for creation of employment opportunities in the private and public sectors.

4.6. Smart Urban Solutions

- *Smart Energy Management:* Develop an Artificial Intelligence (AI)-powered energy management system that uses Internet-of-Things (IoT) sensors to monitor and optimize energy consumption in buildings throughout the city. The system can provide real-time data on energy usage patterns, predict future demand, and suggest ways to reduce energy consumption and costs. In addition, the sensors can be used to adjust the heating and lighting levels of the buildings depending on the internal room temperatures or which side of the sun the building is facing.
- *Intelligent Traffic Management:* Develop an AI-powered traffic management system that uses IoT sensors to monitor traffic flow in real-time. The system can predict traffic patterns and provide suggestions to drivers for alternate routes to reduce congestion and optimize travel times. The analysis and prediction system can be shown using GIS dashboards and applications.
- *Smart Parking:* Develop an AI-powered smart parking system that uses IoT sensors to guide drivers to available parking spaces in the city. The system can also suggest the most efficient routes to parking spots, reducing congestion and optimizing parking space utilization.
- *Smart Agricultural/Greening Initiatives and Precision Farming*: Develop an IoT-enabled agriculture system that uses AI to optimize city's greening initiatives and reduce water usage. The system can use data from sensors placed in fields to monitor soil moisture, temperature, and other variables, providing farmers with real-time insights into their crops' health and productivity.
- *Waste Management:* Develop an IoT-enabled waste management system that uses AI to analyze the data collected from smart bins and sensors placed throughout the city. The system can optimize waste collection schedules, track waste disposal trends, and suggest ways to reduce overall waste production.
- *Water Management:* Develop an IoT-enabled water management system that uses AI to monitor water usage and detect leaks in the water supply network. The system can also predict water demand patterns and optimize the distribution of water resources throughout the city.
- *Air Quality Monitoring:* Develop an IoT-enabled air quality monitoring system that uses AI to detect and analyze air pollutants in real-time. The system can provide real-time data on air quality levels, predict future trends, and suggest ways to improve air quality throughout the city.
- *Emergency Response:* Develop an AI-powered emergency response system that uses IoT sensors to detect and respond to emergencies in real-time. The system can analyze data from sensors placed throughout the city, such as CCTV cameras and motion sensors, to identify and respond to emergencies quickly and efficiently. Similarly, the analysis and prediction system can be shown using GIS dashboards and applications.

5. Areas for Future Collaboration between the United Nations Development System and the Government of Turkmenistan

- The Arkadag smart city initiative has great potential to improve the lives of residents and decrease environmental impacts, while also serving as a model for other cities in Turkmenistan and around the world.

- Share good practice developed in the case of Arkadag city at sub-regional and global levels at key events (see separate roadmap for important exposure events);

- Invite relevant peers to Turkmenistan to share the Arkadag City experience from visioning to implementation and management of the new city development; and

- Knowledge exchange and collaboration to refine application of sustainability principles within the context of Turkmenistan for replication at other locations in the country, both for the construction of new cities and the regeneration and upgrading of existing urban areas.

- The UN-Joint-Arkadag City partnership is recommended to continue and expand its work on smart city planning and development to promote sustainable development principles in Turkmenistan and other cities globally. This includes incorporating renewable energy sources, promoting energy efficiency and climate resiliency, strengthening environmental education, investing in green spaces, and improving quality of life.

- The recommendation is to provide support for capacity building within the Arkadag City municipality, which includes training on smart city planning and management, digital design and operations, and increased stakeholder engagement.

- Develop a programme for capacity building and creating capabilities in the country to collect, analyze and put to dashboards evidence-supported and AI processed decision-facilitating data, new solutions for further smartification of urban management as well as other public or industry supporting services (in coordination with the Ministry of Foreign Affairs and the Ministry of Education of the Republic of Turkmenistan).

- An invitation has been extended to Turkmen Experts involved in Arkadag's smart city project to join a team of experts in the evaluation and certification of seven ecocities in Morocco[8], in partnership with Ecocity Builders and UNEP. The invitation includes a site visit to Morocco in May 2023.

- Turkmenistan to join the "Friends of People-centered Smart Cities"[9] promoting the preparation of global guidelines for implementation locally at global scale. Lessons learnt from Turkmenistan and Arkadag smart city would be much appreciated. This is facilitated by the French Permanent Representative to UN-Habitat.

- The possibility of connecting the city planning policy approach and digital modeling with AWS's Smart Territory Framework based on open standards, is being discussed. It is noted that it could be of interest to Arkadag City to create a foundation for future digital connectivity and interoperability. However, it is not known how Arkadag City has configured its digital system.

- The suggestion is made that connecting the city planning policy and digital modeling with AWS's Smart Territory Framework[10] could be of interest to Arkadag City for future digital connectivity and interoperability, but the configuration of Arkadag City's digital system is currently unknown.

- EcoCity Builders proposes to engage with Turkmenistan on a project involving innovative hydroponic systems that capture CO_2 from various sources and convert it to biomass for use as food or biochar. The biochar can then be used to improve soil quality and nourish plants. Arkadag City may partner to help test the system and eventually make it available as an open-source product.

- Turkmenistan might be interested in hosting a session of the Ecocity Forum, supported by the UN development system. Interested parties can provide a proposal based on the guidelines.

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[8] https://ecocitymorocco.org
[9] https://unhabitat.org/programme/people-centered-smart-cities
[10] https://www.fiware.org/2022/07/04/how-the-smart-territory-framework-helps-territories-create-smart-and-sustainable-services-for-their-residents/

6. Disclaimer

Members of the joint United Nations mission were:

- Ms. Katja Schaefer, Inter-Regional Advisor for Eastern Europe and Central Asia at Programme Development Branch, Global Solutions Division, UN-Habitat

- Mr. Herman Pienaar, Head of Urban Lab at Planning, Finance and Economy Section, Urban Practices Branch, Global Solutions Division, UN-Habitat

- Ms. Kirstin Miller, Executive Director, Ecocity Builders, representing UNEP

- Mr. Farrukh Alimdjanov, Industrial Development Officer, Division of Digital Transformation and AI Strategies, Technical Cooperation and Sustainable Industrial Development, UNIDO

- Ms. Sanjeevani Dilanthi Singh, Economic Affairs Officer, Sustainable Urban Development Section, Environment and Development Division, UN ESCAP

- Mr. Atamuhamed Sariyev, Energy Efficiency Specialist of the UNDP project "Sustainable Cities in Turkmenistan: Integrated Green Urban Development in Ashgabat and Avaza", UNDP

The views expressed in this publication are those of the authors and do not necessarily reflect the views of the United Nations.

ANNEX 2.1: IMPORTANT EXPOSURE EVENTS

- **Group of Friends** of UN-Habitat, Sustainable Urbanization and the New Urban Agenda @ New York, USA (https://www.un.org/pga/76/2022/06/21/official-launch-of-the-group-of-friends-of-un-habitat-sustainable-urbanization-and-the-new-urban-agenda/)

- **27-30 March 2023 @ Bangkok, Thailand**
  Regional intergovernmental forum to review progress on the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs), & regional preparatory meeting to the High-Level Political Forum (HLPF). (https://www.unescap.org/events/apfsd10)

- **29 – 30 March 2023 @ Geneva, Switzerland**
  Regional Forum "*Ensuring the implementation of the 2030 Agenda for Sustainable Development in the ECE Region in times of multiple crises*" (https://regionalforum.unece.org/events/regional-forum-2023)

- **1 April 2023** – start of registration
  Dubai International Award for Best Practices (https://www.dubaiaward.ae)

- **24 April 2023 @ Nairobi, Kenya**
  RC Dmytro Shlapachenko on mission in Kenya – meeting with ED, Chief of OED a.i., Chief of ERSKI (TBC)

- **May/June 2023 @ Arkadag City, Turkmenistan**
  Opening Ceremony Arkadag City;
  suggestion: Invitation of representatives from sub-region to Turkmenistan to be inspired by the initiative

- **Tbc @ Ashgabat/ Arkadag, Turkmenistan**
  Senior UN officials at Turkmenistan (suggestion: Arkadag City Launch)
  Mission of UN ESCAP ED to Turkmenistan
  Mission of UN-Habitat ED to Turkmenistan

- **5 – 9 June 2023 @ Nairobi, Kenya**
  Second UN-Habitat Assembly *"A sustainable urban future through inclusive and effective multilateralism: achieving the Sustainable Development Goals in times of global crises"* (https://unhabitat.org/events/second-un-habitat-assembly)

- **6 – 8 June 2023 @ London, UK**
  Ecocity World Summit - global conference on ecology and cities. Every two years it brings together urban stakeholders from across the globe to focus on key actions cities and citizens can take to rebuild our human habitat in balance with living systems. (https://www.ecocity-summit.com/)

- **10 – 19 July 2023 @ New York, USA**
  High-level Political Forum on Sustainable Development *"Accelerating the recovery from the coronavirus disease (COVID-19) and the full implementation of the 2030 Agenda for Sustainable Development at all levels"* (review in-depth SDG 6 on clean water and sanitation, 7 on affordable and clean energy, 9 on industry, innovation and infrastructure, 11 on sustainable cities and communities, and 17 on partnerships)
  10 – 14 July 2023 - Economic and Social Council
  10 – 14 July 2023 - high-level segment of the Council, including the three-day ministerial segment of the HLPF
  (https://hlpf.un.org/2023)

- **September 2023 @ New York USA**
  SDG Summit – the High-level Political Forum on Sustainable Development (https://www.un.org/en/conferences/SDGSummit2023)

- **October 2023 @ various locations**
  Urban October – 1 – 32 October 2023
  World Habitat Day – 2 October 2023
  World Cities Day – 31 October 2023

- **October 2023 @ Zangilan and Baku, Azerbaijan**
  Azerbaijan National Urban Forum #2
  Sub-Regional Forum Central Asia/ Turkic Council #1

- **23 – 25 October 2023 @ Suwon, Republic of Korea**
  8th Asia-Pacific Urban Forum
  (https://www.unescap.org/news/announcing-suwon-republic-korea-host-city-8th-asia-pacific-urban-forum-be-held-23-25-october)

- **October 2023 @ tbc**
  Bridge for Cities 5.0 - annual event promoting implementation of 2030 Agenda for Sustainable Development via Belt and Road Initiative
  (https://www.unido.org/bridge-for-cities)

- **October 2023 @ Vienna, Austria**
  Vienna Energy Forum, Side event on Artificial Intelligence for Manufacturing during the Vienna Energy Forum; Side event on Artificial Intelligence for Manufacturing

- **2024 @ Cairo, Egypt**
  12th Session of the World Urban Forum

ANNEX 2.2: ECOCITY BUILDERS' INPUT SECTION

Ecocity Builders has been working in the city arena since 1992, and today, even as climate change and other serious global problems press down on humanity, we remain hopeful because of the spirit of cooperation and joining of forces that we experienced on this mission.

Based on our site visit to Arkadag smart city and the productive discussions with the UN Mission delegation, the RCO, the Arkadag City mayor and city administration and the Turkmenistan Ministry, we recommend the following future actions and activities, via our partnership with UNEP and in full collaboration with other UN agencies.

First, we recommend that the UN-Arkadag City partnership continue and expand its work on smart city planning and development. The Arkadag smart city initiative has great potential to improve the lives of residents and decrease environmental impacts, while also serving as a model for other cities in Turkmenistan and around the world.

Second, we recommend that the partnership continue to promote sustainable development principles in all aspects of the smart city planning process. This includes incorporating renewable energy sources into the city's infrastructure, promoting energy efficiency and climate resiliency, strengthening environmental education and engagement of youth, and continued investing in green space and other amenities that improve quality of life.

Third, we recommend that the partnership provide support for further capacity building within the Arkadag City municipality. This could include training on smart city planning and management, digital design and operations using open standards for data interoperability and connectivity, and to increase opportunities for broadening stakeholder engagement.

Fourth, we recommend that the partnership continues to collaborate closely with other UN agencies working in Turkmenistan, to maximize synergies and avoid duplication of effort.

Finally, we offer the following specific ideas that we would like to pursue with this group and Turkmenistan, should there be interest.

- We would like to invite someone involved in Arkadag's smart city project to serve on a team of experts to evaluate a project to certify 7 ecocities in Morocco in partnership with Ecocity Builders and UNEP. https://ecocitymorocco.org/ There is a site visit to Morocco in May related to this.

- We would like to invite someone like the above to present the neighborhood scale of Arkadag city at our upcoming conference in London this June with us and UNEP. https://www.ecocity-summit.com/

- We are discussing linking our city planning policy approach and digital modeling with AWS's Smart Territory Framework, based on open standards https://www.fiware.org/2022/07/04/how-the-smart-territory-framework-helps-territories-create-smart-and-sustainable-services-for-their-residents/ I am not sure how Arkadag City has configured its digital system, but this could be of interest, to help create a strong foundation that can build into future digital connectivity and interoperability based on open standards.

- We would like to engage with Turkmenistan on a project we're developing: an innovative modular/scalable hydroponic system that captures CO2 from industry, buildings, homes, apartment buildings, etc. and sequesters the CO2 in biomass that can become either food or biomass for biochar. The biochar can be added to landscaping to improve soil, hold water, and nourish plants, like the trees being planted in the greenbelt for example. We are looking for a few partners to help us test this further. We currently have an initial prototype up and running with our team in Mexico. We want to make it available as an open-source product eventually.

- The other use for the biochar from biomass is as an additive to concrete, to make it stronger and CO_2 neutral. Maybe Turkmenistan would be interested in helping lead with us in this green materials space.

- Finally, at some point Turkmenistan might be interested in hosting one of our event series, in cooperation with other UN agencies. We have one called Ecocity Forum. This event does not go to a bid like Ecocity World Summit, our main event. For a Forum, you just provide a proposal based on the guidelines. It is a newer and more focused event series that has been convened in Vancouver, India, Greece, Finland, and upcoming in Panama.

Respectfully yours,

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ANNEX 3:   CERTIFICATES

ANNEX 3.1: UN-HABITAT

ANNEX 3.2: UNESCAP

ANNEX 3.3: UNEP

ANNEX 3.4: UNIDO