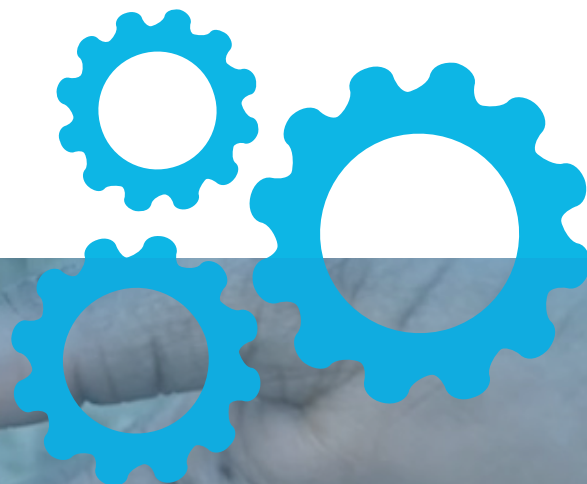


Digital Tools for Sustainable Urban Futures



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Housing & Informal Settlements



Basic Urban Services



Crisis Response & Resilience



Participatory Multilevel Governance



Across the world, cities are growing at an unprecedented pace. **Over half of the global population currently lives in cities.** By 2050, this rate is expected to reach 70 percent.

Rapid urbanization is transforming the way people live and work, but it also brings profound challenges — from deepening inequalities and underserved communities lacking access to basic urban services, to the impacts of armed conflict, displacement, and climate change. Vulnerable communities are often the most affected, facing daily risks to their safety, livelihoods, and well-being.

At the same time, the rapid increase in **digitisation** is reshaping how cities are planned and managed, offering new opportunities to address these challenges through **data-driven and people-centered approaches.**

In this context, the **United Nations Innovation Technology Accelerator for Cities (UNITAC-Hamburg)** works to advance the use of data, digital technology, and innovation to create more inclusive, resilient, and sustainable urban futures for all.

About UNITAC



The **United Nations Innovation and Technology Accelerator for Cities (UNITAC-Hamburg)** is an innovation lab in Hamburg, Germany, established in March 2021 by the The United Nations Human Settlements Programme (UN-Habitat) in collaboration with the UN Office of Information and Communications Technology (OICT) and HafenCity University (HCU).

The Accelerator promotes **open and participatory data governance** and **digital platforms, innovations related to mapping, spatial analysis, data visualization, and people-centred smart cities** for a sustainable urban future. UNITAC was financed by the government of Germany.

We work with local governments and stakeholders to identify and co-create data and digital solutions to real world problems. Some solutions benefit from well-tested and simple technological approaches. In other cases, we utilize scenario planning methods, Artificial Intelligence (AI) or other advanced technology. In every case we aim to support projects that are **need driven**. The projects must respond to an actual demand or need identified by local leadership and the

local community, addressing the most pressing or emerging urban challenges. In this way, we are advancing the approach of **People-centred Smart Cities**, where the primary purpose of digital technologies for urban development is to improve the quality of life of residents inclusively, promoting equitable access to digital tools and urban services aligned to the goals of the **New Urban Agenda**.

We develop data platforms and geospatial applications that are compliant with Open Geospatial Consortium (OGC) standards, utilizing open-source modules. Starting with user needs assessments and the problem statements of our stakeholders, we design technical infrastructure with scalability, portability and sustainability in mind.

Another objective of UNITAC is to co-create data and digital solutions that have potential to be expanded to other geographic areas within a city or country, or to new places to benefit ever more people. For this reason, we work to develop and package tangible tools and products that can be handed over and scaled to other regions and / or contexts.



UNITAC is guided by the **New Urban Agenda** and aligns closely with the **2030 Agenda for Sustainable Development**, with a particular focus on **Goal 11: making cities and human settlements inclusive, safe, resilient, and sustainable.**

Our Offer



STRATEGY

We analyse and provide technical expertise on urban digital transformation, data strategies and digital governance frameworks.



TOOLS

We provide innovative approaches and digital tools on public participation, spatial analysis, mapping, data simulation and visualization.



CAPACITY

We provide practical training, knowledge exchange and technical advice.

Our services are delivered through the following modalities:

- Digital transformation readiness assessment
- Strategic advice on urban digital transformation
- Development of smart city, data and digital transformation strategies, frameworks and policies
- Urban data visualization, analysis and scenario planning platform
- Citizen science, crowdsourcing and participatory data collection
- Digital public participation toolbox
- Digitally-enhanced service provision
- Training for city leaders on people-centred smart cities
- Technical advice service on digital platforms, tools and approaches

- Innovative digital strategies and tools for **adequate housing, land and basic services**
- **Informality mapping** using AI and geospatial techniques
- Data analytics and spatial intelligence to support **equitable urban planning**
- Digital capacity-building and knowledge exchange for **sustainable urban development**

Where UNITAC tools are being used

UNITAC is collaborating with local partners and local governments on various projects in the following countries:



● project sites ● office sites



UNITAC training for mayors at Devolution Conference in Kenya, 2025 in partnership with UN-Habitat Kenya Country Office and the Council of Governors

UNITAC works across Africa, Latin America, Asia-Pacific and Europe to tackle challenges from informal settlement mapping to water access, crisis recovery, and citizen participation.

We deploy people-centred technologies such as AI mapping, mobile and USSD apps, participatory platforms, geospatial visualizers, and open data tools to deliver inclusive and scalable urban solutions.

UNITAC's projects focus on four thematic areas:

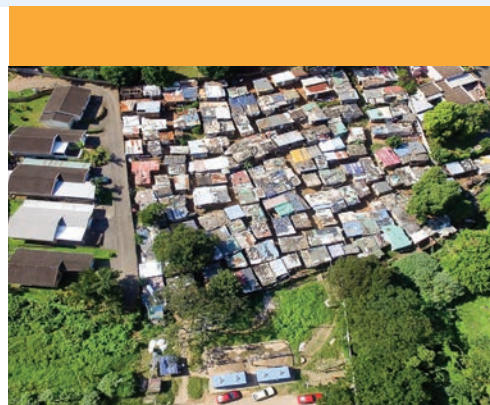
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Housing & Informal Settlements

Adequate housing is fundamental to human dignity and sustainable urban development. Yet, 1.1 billion people live in informal settlements and slums, where access to secure housing, essential services, and infrastructure remains limited¹.

UNITAC supports cities and communities in using data, spatial analysis, and innovative digital tools to better understand urban dynamics, plan inclusive upgrading, and co-design urban solutions that leave no one behind.



UNITAC projects:

- Mapping of building footprints in informal settlements in South Africa, Namibia and Central America

Digital platforms and tools:

- Building & Establishment Automated Mapper (BEAM) (see p.20)
- Geo Visualizer (see p.22)

2



Basic Urban Services

From water, sanitation, and energy to public transportation and waste management, the equitable provision of urban services is key to improving quality of life and advancing the Sustainable Development Goals.

UNITAC works with local authorities to strengthen service delivery through digital innovation and people-centered approaches—helping cities become more efficient, transparent, and responsive to community needs.



UNITAC projects:

- Digitizing business workflows for evidence-based decision making and improved urban service provision in Namibia

- Enhancing water access in Hargeisa

Digital platforms and tools:

- Digital Job Card (see p.24)
- Dhaamiye (see p.26)

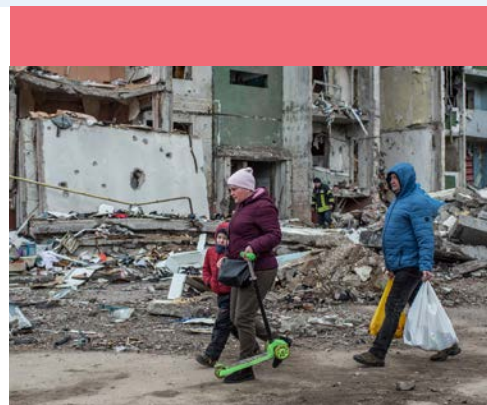
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Crisis Response & Resilience

Cities are on the frontlines of multiple, overlapping crises—ranging from climate impacts and pandemics to conflict and displacement.

UNITAC helps local and national partners harness data and digital technologies to anticipate risks, coordinate response, and build resilience. Through innovative tools and capacity-building, UNITAC supports evidence-based decision-making in the urban crisis response planning and strengthens long-term recovery.



UNITAC projects:

- Data visualization for urban recovery planning in Ukraine

Digital platforms and tools:

- Urban Recovery Planning System (URPS) (see p.28)
- GioMap (see p. 30)

4



Participatory Multilevel Governance

Effective governance requires collaboration across institutions and levels of government, as well as meaningful participation from citizens.

UNITAC promotes people-centered, data-informed decision-making by developing digital tools and participatory methods that make governance more inclusive, transparent, and accountable. These approaches enable local voices to shape urban policies and ensure that innovations serve the public good.



UNITAC projects:

- Public participation for facilitation of inclusive dialogues in Brazil

Digital platforms and tools:

- AОВI - Real-time participation (see p. 32)
- Comprehensive Knowledge Archive Network (CKAN) (see p. 34)



Using Artificial Intelligence for better city planning, Central America and South Africa



Ground truthing maps of informal settlements in eThekweni Municipality

BEAM changed our workflows and accelerated detection processes... we are able to get a turnaround time now of 72 hours across the whole of eThekweni. BEAM has been a great help.

Snobani Dweku
Corporate GIS, eThekweni Municipality

In South Africa, **eThekweni Municipality** has the largest number of informal settlements in the country, with over a quarter of the city's 4.2 million residents living in informal areas.² Continued urbanization and a dwindling supply of well-located serviced land has resulted in a multitude of vulnerabilities experienced by its population.

In 2022, the Human Settlements Unit of eThekweni Municipality applied for **UNITAC's open call for projects, funded by the German Ministry of Foreign Affairs**, to receive technical support to develop the **Building and Establishment Automated Mapper (BEAM)**.

The objective of the BEAM tool was to develop an innovative and scalable approach to help the city improve its land monitoring process. The tool leverages machine learning to identify buildings in aerial imagery, with a particular focus on informal areas. eThekweni Municipality has used BEAM to map buildings throughout the whole city, providing accurate and up-to-date information to its officials.

Innovation component

Prior to the introduction of the BEAM tool, informal structures in eThekweni were identified by on the ground land monitors, with 15 Land Monitors servicing 587 informal settlements, and through manual marking of structures on aerial photography. This workflow greatly limited the city's capacity to respond to residents' needs in an efficient and effective way. The BEAM tool enhanced the efficiency of this process, allowing officials to map the entire city in 72 hours.



This means that the city can have up-to-date records of the location and extent of structures in its informal settlements, as well as keep track of changes in the built-up area or density.

In collaboration with UN-Habitat Mexico, BEAM was applied on satellite imagery to gain an understanding of the morphological characteristics of informal settlements in Central American cities, such as Guatemala City, Tegucigalpa, Belize City, San Salvador, Santo Domingo, San José, Managua, Panama City.

In the City of Cape Town, BEAM was applied to high resolution aerial imagery, with a specific focus on assisting the

City in understanding the growth of informal structures in the backyards of formal residences.

A second pilot project with eThekweni Municipality is underway, with the objective of utilizing BEAM to distinguish formal from informal structures. Additionally, the tool is part of an ongoing collaboration aimed at supporting the UN-Habitat Data and Analytics Unit in efforts to monitor SDG 11.1, with partners including ETH Zurich and the University of Twente.

[For technical details and more information on our housing & informal settlements related tools, see pages 20 - 23.](#)



Project Results and impact

- The data generated with BEAM helps city planners to identify growth patterns and better understand the dynamics of informal settlements, enabling municipalities to prioritize upgrading initiatives.
- BEAM mapped 1,530,546 residential and non-residential building footprints across eThekweni municipal area.
- In Cape Town, an additional 822,390 building footprints were detected using BEAM and integrated into the city's geographic database.
- BEAM mapped 6324 informal areas and detected 550,776 buildings across eight Central American cities.
- In eThekweni Municipality, BEAM reduced mapping time from months to just 72 hours, enhancing efficiency and accuracy.



Bridging water access for the urban poor in Hargeisa



Water vendor in Hargeisa

“This innovative solution is a game-changer for women, eliminating the need for long walks to fetch water, saving time, and significantly improving overall well-being.”

Hargeisa Water Agency



Read the impact story

In early 2024, UNITAC launched its second **open call** for innovative projects to promote people-centred smart cities where technology is applied carefully and strategically to leave no one behind. We believe in the power of well-managed and inclusive digital transformation to achieve urban sustainability.

Through our demand-driven innovation approach, we identify projects that work on improving the quality of life in cities, especially for marginalized communities.

For this open call, **funded by the German Ministry of Foreign Affairs**, UNITAC invited organizations to submit project ideas that address the most pressing urban challenges with data or technology solutions. **Hargeisa Water Agency** submitted one of the winning proposals.



Innovation component

Hargeisa, the largest city in Somaliland, only a small number of residents have access to piped water through household connections or kiosks. For the vast majority, fetching water is a daily struggle. These residents, traditionally women or older girls, must walk long distances to fetch water from water kiosks.

This project with Hargeisa Water Agency introduces a **digital water platform** named “**Dhaamiye**”, connecting users in disadvantaged settlements in Hargeisa - who do not have a piped water connection - with certified water vendors through a mobile application.

The application introduces accountability into the water supply chain, eliminates the need for middlemen and helps to regulate the water prices.

This innovative solution will be valuable for disadvantaged communities, especially for women, significantly improving access to safe drinking water.

For technical details and more information on our basic urban services related tools, see pages 24 - 27.



Focus group with female residents in Hargeisa



Project results and impact

- The tool addresses underserved settlements where only an estimated 30–37% of residents have piped connections by removing intermediaries, surfacing transparent prices, and improving delivery reliability.
- Expected benefits for the users include greater affordability, transparency and service quality, with specific benefits for women who disproportionately shoulder water collection. Community research highlights long waits, price volatility, and safety concerns. Residents in pilot areas often spend a significant amount of their income on water. These are issues the app tackles via transparent and stable pricing, ratings, and low-tech access (USSD).
- For water vendors, this digitalization represents an opportunity to improve operational efficiency, streamline service delivery, and gain formal recognition, thereby addressing long-standing informality in their work.



Basic Urban Services

Digital solutions for more climate resilient informal settlements in Namibia



Read the
impact story

Today, more than 40% of Namibia's overall population – and around 80% of its urban population – live in informal dwellings.³ At a national level, **upgrading informal settlements** is a priority for the Ministry of Urban and Rural Development.

The project “*Just Transitions in Vulnerable Places – Digital Solutions for More Climate Resilient Informal Areas in Namibia*” funded by the **Ministry of Economic Cooperation and Development (BMZ)** aims to build digital and data capacity of the national and local governments to support urban decision making and planning.

Together with national and local stakeholders, we are exploring ways to improve their digital and data capacity, enabling them to extract greater value from their data. Additionally, we are working to co-develop digital solutions and processes, enabling them to make better decisions, plan better, and ultimately deliver better services to the community.

UNITAC collaborates with the Namibia Statistics Agency (NSA) to enhance the understanding of informal settlement dynamics across 7 towns in Namibia in two ways: **growth analysis** and **mapping of basic**

infrastructure services and facilities. This is key to analysing the quality of urban living among the settlement dwellers.

In Namibia, a just transition for people living in informal settlements includes receiving access to basic services and tenure security. We have applied a design thinking approach to understand user needs and the priorities of local governments in planning for and delivering basic services such as water, sanitation and waste management.

UNITAC has hosted ideation workshops with four of its partner towns: Rehoboth, Rundu, Opuwo and Helao Nafidi. At the outset, local administrations faced several operational challenges, including paper-based processes, slow response times to service requests, and limited monitoring of repairs and service delivery. A common priority identified across the towns was the need to **digitalize basic business processes** such as job cards, which technical staff use to report issues to managers (e.g. water leakages, building inspections, etc). In doing so, data about performance, resource needs and service requests can be captured immediately, and decision makers can have real-time information to enable data-driven decision making. One example is the standardized management and advanced analysis of data to reduce non-revenue water losses in Rundu.



Inspecting water infrastructure in informal settlements in Namibia



On the weekend, they are using a paper job card. The community also signs off on the job card – what was done. It's approved that they were there... Yes, my reporting will be much easier. Now I don't need to go and physically count how many call outs there were.

Willie Jansen, Head of Water and Sewerage Division, Rehoboth Town Council



Inspecting water infrastructure in informal settlements in Namibia

At the same time there is an opportunity to incorporate citizen-driven data collection into business processes and foster greater inclusivity, transparency and accountability. In small towns, like Opuwo and Rehoboth, digital and data readiness is vastly different. In some cases, we can pilot and test innovative technology and tools, and in other cases we can be innovative in how we apply tried and tested digital tools to solve immediate needs.

In partnership with UN-Habitat Namibia, UNITAC collaborates with local authorities to strengthen urban service delivery through the strategic use of

digital tools and data, while fostering innovative solutions for resilient, people-centred smart cities. With the City of Windhoek, we are co-developing the Windhoek Smart City Strategy.

For technical details and more information, see the tools overview on pages 22 to 25.



Project results and impact

- With the introduction of reliable digital tools and processes, local governments can reduce delays in basic service provision, improve accuracy, and make better use of limited resources. For the approximately **190,000 people** living in **Rundu, Opuwo, Helao Nafidi, and Rehoboth**⁴ this means **improved infrastructure** and more **reliable access to basic urban services**.
- The activities in collaboration with the Namibia Statistics Agency (NSA) directly contribute to development of comprehensive **informal settlement profiles**, with identification of specific areas of intervention, a shift from previous profiles which have been purely based on socio-economic data. By empowering NSA to directly implement the activities, through capacity development, the project's impact will outlive its lifecycle, and guarantee continuous updates to the **Namibia Housing Information System (NHIS)**, into which the data generated during the project implementation will feed into.
- UNITAC's support on enhancing the capacities of NSA staff on data management based on global database management standards will directly contribute to improved data and systems interoperability, and enhanced value of data for planning and development processes.



Digital tools and capacity for inclusive, smart and resilient recovery in Ukraine

Since February 2022, UNHCR reports that more than **6.9 million people fled the country**, while an estimated **3.7 million became displaced within Ukraine** itself.⁵ In the Western part of the country, the arrival of internally displaced persons (IDPs) has been especially visible, increasing pressure on the administration of hromadas (the Ukrainian term for municipality).

This rapid demographic change is happening against the backdrop of a widespread housing crisis. By 2024, more than **10% of Ukraine's housing stock**⁶ —impacting nearly two million households— had been damaged or destroyed. Around **250,000 housing units**, or **8.6%** of the country's total residential area, require repair or reconstruction.⁷

The project “*Just transitions in vulnerable places - Towards Inclusive, Smart, and Resilient Urban Recovery*”, funded by the **German Federal Ministry of Economic Cooperation and Development (BMZ)**

supports Ukrainian local governments by strengthening their digital and data capacities for recovery and reconstruction.

As part of this effort, UNITAC co-developed the **Urban Recovery Planning System (URPS)**, a spatial decision support tool that enables hromadas to visualize and analyze sectoral data. URPS includes

modules for geospatial public participation, reachability analysis, and facility simulation, allowing users to explore ‘what if’ scenarios for more informed decision-making.

The project engages with national and local authorities in Ukraine—including the Ministry for Communities and Territories Development and the hromadas of Makariv, Drohobych, Irpin and Kamianets-Podilskyi—as well as with civil society organizations and academia. In addition, UNITAC works closely with the UN-Habitat Ukraine Country Office and the Ukraine Urban Lab to identify how the digital platform can best support Ukraine's sustainable recovery and contribute to building back better.

Innovation component

UNITAC's Just Transitions project applies a multifaceted innovation approach to urban recovery in Ukraine.

Co-creation: The project employs innovation methodologies such as challenge-driven innovation and human-centred design to co-create and develop the platform and its use cases with partner governments and local stakeholders, ensuring relevance, ownership, and long-term sustainability.

Technical integration: Drawing on expertise in GIS, data science, software development, and urban recovery planning, the project integrates diverse datasets across government



levels. This enhances coordination, supports evidence-based decision-making, and promotes efficient resource allocation.

Standardization and scalability:

The tool establishes a standardized municipal data platform and database that serve as an entry point for short-, medium-, and long-term planning. It complements urban recovery documentation that is often static, and supports their implementation by providing accessible, harmonized data for more dynamic evidence-based planning.

The project launched a new course, “Urban Data Science and Quantitative Methods,” at the Kyiv School of Economics as part of its Master's Programme in Urban Studies and

Postwar Reconstruction. The course equips future municipal managers, community leaders, and urban planners with essential digital and data science skills.

For technical details and more information on our crisis response and resilience related tools, see pages 28-31.



Credit: UNDP Ukraine, Oleksandr Ratushniak



Project results and impact

Upon implementation the tool is expected to have the following impact:

- Supporting recovery by helping hromadas respond to population shifts and prioritize housing reconstruction for millions affected by displacement and damage.
- Improving access to services by guiding data-driven decisions to restore schools, healthcare, and infrastructure where communities need them most.
- Empowering local voices by enabling residents to take part in shaping recovery plans that reflect their needs and priorities.
- Building lasting capacity by strengthening digital and planning skills of local authorities and urban professionals for sustainable, people-centered recovery.
- Ensuring transparency making recovery data accessible and comparable across regions, fostering accountability and trust.

⁵ Ukraine Situation Flash Update #80 (UNHCR, 2025)

⁶ UNHCR: After three years of war, Ukrainians need peace and aid (UNHCR, 2025)

⁷ Report on damages to infrastructure from the destruction caused by Russia's military aggression against Ukraine (KyivSchool of Economics, 2024)



Participatory Multilevel Governance

Supporting Brazil's vision for 2050 with digital participation



AOVI as part of the Brazil 2050 strategy process

AOVI is an open-source **public participation tool** developed by UNITAC through an agile process to support inclusive dialogue in the Regional Dialogues for Brazil's Strategy 2050, organized by the Ministry of Planning and Budget. It complements participatory planning by providing **qualitative data** and a **platform for multilevel stakeholder engagement** to define long-term goals for economic development, social inclusion, and sustainability.



AOVI enables inclusive and strategic planning while serving as an entry point to a broader strategy for innovation and digital transformation, using

data storytelling, urban data governance, and participatory methods tailored to specific groups, including youth, women, and girls.

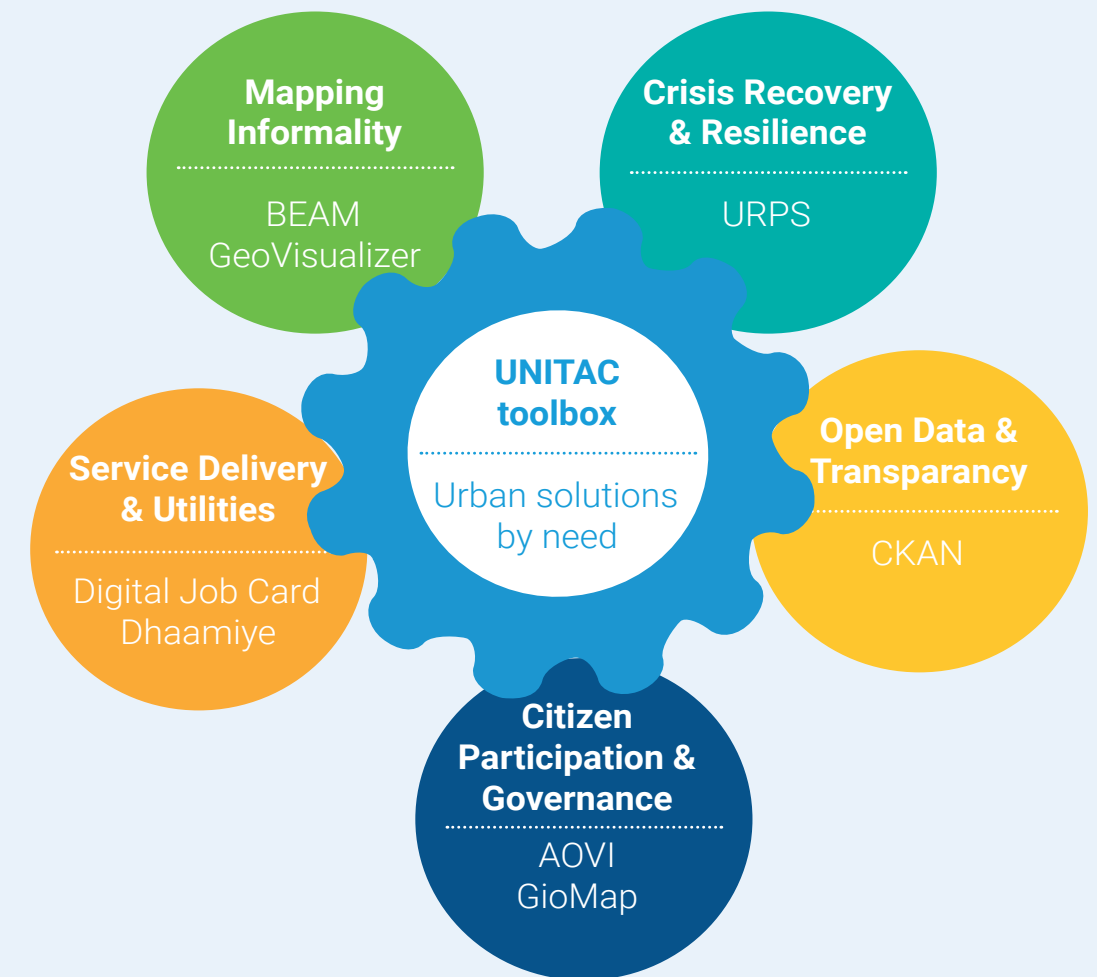
With the support of the UN-Habitat country office in Brazil, the cooperation strengthened the federal government planning process, leveraging innovation, digital tools, data and stakeholders' engagement. The project also built capacity within the Ministry—designing the tool alongside planning staff strengthened their skills in participatory digital engagement.

Challenges in developing inclusive public consultations include digital and geographic inequalities, limited trust in institutions, and underrepresentation of vulnerable groups. Yet, there are many opportunities for civic innovation and participatory governance. Strengthening public participation in SEPLAN's Strategy 2050 process can improve legitimacy, transparency, and the quality of long-term planning, ensuring that national development reflects the diversity and aspirations of all Brazilians.

Over 3000 participants in 12 regional workshops engaged with AOVI in Brazil, and used the tool to share their perspectives on challenges and opportunities, as well as what is the Brazil they wish to live in 2050.

[For technical details and more information on our tools related to participatory multilevel governance see page 32-35.](#)

UNITAC toolbox



UNITAC develops, tests, and applies a wide variety of innovative tools and technologies to address urban needs and support the implementation of global agendas at the local level.

These tools combine data, technology and participatory approaches to strengthen evidence-based decision-making and foster inclusive urban development. By providing practical resources for spatial analysis, visualization and co-creation, the toolbox enables governments and partners to work together towards more sustainable, resilient and people-centered cities.

While UNITAC's tools are designed for scalability and can be adapted to different cities and governance contexts, we recognize that effective scaling requires careful attention to local legal frameworks, digital skills, and capacity. UNITAC advocates for responsible data use and ethical AI, ensuring that innovation advances sustainable, people-centered urban solutions while managing potential risks.

[Contact unitac@un.org](mailto:unitac@un.org)
for more information about how to use the tools in your region.



Building Establishment Automated Mapper (BEAM)



More info

BEAM is an **AI tool** that uses **machine learning** to **automatically map rooftops of buildings in informal settlements** for a variety of communal benefits.

The tool is simple and easy to use. It allows users to quickly detect and visualise building footprints and structures in a specific area by uploading aerial images of a given location. Through four easy steps, it predicts which buildings are present in an image by identifying and geo-referencing the pixels that are likely rooftops.

The version used by eThekweni and the City of Cape Town is designed to be run and hosted locally by the city, with the developments in the Central America project optimized for running on the cloud.



Buildings mapped using BEAM in Guatemala and Santo Domingo



BEAM is one of the tools which will enable us to better understand the trends in urban development in the city. It will also create better efficiencies and create a platform for sharing of data so that we can improve our delivery of basic services... to those excluded from the formal areas of the city.

Sarah Watson, Human Settlements Unit,
eThekweni Municipality

Who is it for?

- Local and national governments
- Urban planners and managers
- Community organizations



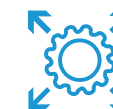
Partners

Human Settlements Department, eThekweni Municipality, South Africa; City of Cape Town Geomatics Branch, South Africa and UN-Habitat Mexico



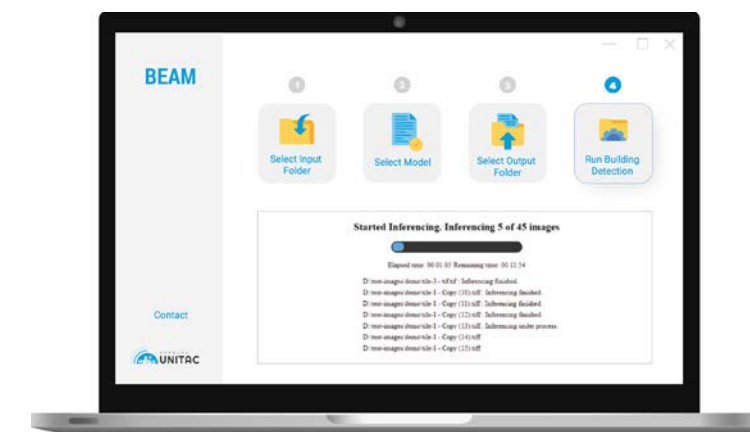
Features and functionalities

- Pixel level accuracy on high resolution aerial imagery: Over 90%
 - Pixel level accuracy on high resolution satellite imagery: Over 84%
 - Fast image processing: 1 image takes 70-90 seconds (depending on the computational power)
 - To effectively map building footprints BEAM requires high-resolution aerial or satellite imagery
- BEAM quickly generates shapefiles of rooftops to help municipalities to
- maintain up-to-date records and maps
 - better prioritize upgrading interventions
 - improve basic service delivery



Scalability

The tool's open-source nature and user-friendly interface facilitates widespread adoption, empowering local governments to integrate it into their urban planning workflows and allowing it to be applied across different cities, contexts and use cases. Access to training data, particularly imagery of the area of interest, is required to ensure accurate and context-specific results. Initially deployed in South Africa, BEAM was subsequently scaled for implementation in eight Central American capitals namely Guatemala City, Tegucigalpa, Belize City, San Salvador, Santo Domingo, San José, Managua, Panama City. UNITAC is currently preparing its deployment in Namibia.



Desktop view of BEAM tool processing aerial images



Geo Visualizer

Geo visualizer is a tool that enables anyone without GIS software or expertise to **open and explore geo-spatial data files** such as GeoJSON, Shapefile, csv.

Based on our work with different stakeholders, we have observed that some local authorities face challenges in accessing digital infrastructure. In certain cases, urban planners do not have the necessary server capacity or software to open and explore their own spatial data. This can limit opportunities for collaboration.

To address this, we developed a tool designed to function without a server and without being constrained by

fixed data table structures, supporting quicker access to insights and analysis.

The workflow is completely offline. Users can start using the tool by simply double clicking the html file. This will open the tool in their browser, and then the user can click upload, and select their geospatial files to visualize the data on a map as well as get a sense of data distribution of various attributes and metadata. We have also adapted the tool to support explorations of surveys data to easily obtain insights about the data in support of informal settlements upgrading. The tool deploys simple web technologies.



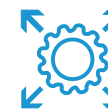
Partners

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Inclusive and Sustainable Urban Development (ISUD) Namibia



Features and functionalities

- Removes the barrier of entry for working with geospatial data, making the tool useful for people with limited technical background.
- Helps users see the benefits of collecting location information.
- Supports analysis at different stages of data management. For instance, during data collection, it can highlight progress or any challenges with data that should be fixed as the data collection progresses.

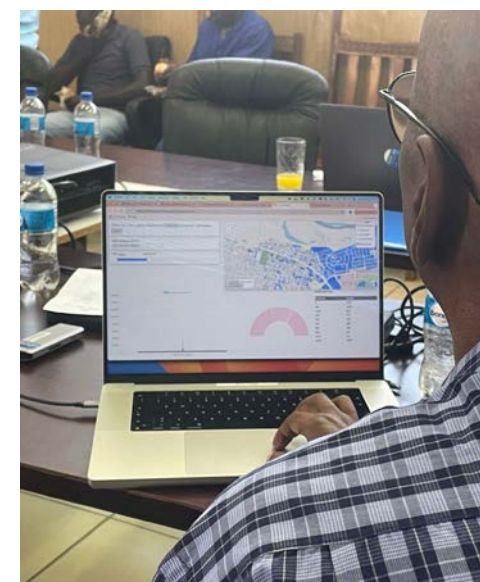


Scalability

Geo Visualizer is a tool that facilitates the exploration of spatial data. This is especially relevant for engaging non-technical stakeholders who are not familiar with existing GIS software. Research projects that are committed to non-extractive data collection, can use this tool to return valuable datasets to the public and research participants. And development projects can adopt this tool in their public participation processes to enable meaningful feedback from non-technical members of the public.



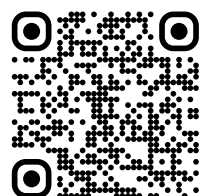
Using Geo Visualizer to open and explore spatial data from Rundu, Namibia



Stakeholders viewing spatial data from Rundu during a workshop

Who is it for?

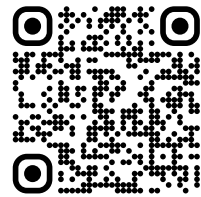
- National, regional and local governments
- UN-Habitat teams



More info



Digital Job Card



More info

The **Digital Job Card** is a web and mobile application designed to work both online and offline. The app **digitalizes the process of creating and tracking job cards for different urban services** or issues such as water meter readings, electricity fault reporting, or building inspection for local authorities in Namibia.

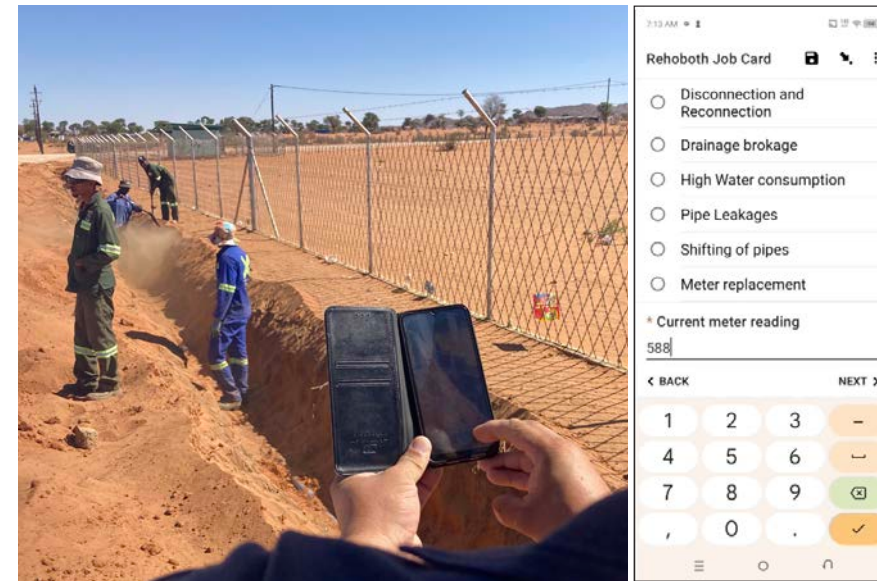
With this system, technical staff and clerks can track and report on the completion of their tasks or the status of the issue, allowing supervisors and managers to have sight of the data in near real time. The collected information can be used for monitoring processes, data management, analysis and visualization, thereby improving information accessibility and evidence-based decision-making,

planning and service delivery. The prototype was developed in collaboration with Rehoboth Town Council, who participated in user needs and ideation workshops, as well as Rundu Town Council who have also participated in user testing sessions.

The application leverages KoboTool-Box and other open-source modules to trigger various communication requirements, such as informing citizens, customers and town council staff on the progress of a job or the status of an application. The tool also makes use of a Content Management System (CMS) in the form of Apache Superset to easily monitor KPIs, as well as detect operational bottlenecks, hence contribute to efficient resource management.

Who is it for?

- Local and national governments



User testing with the Water and Sewerage Division in Rehoboth, reporting the laying of new water pipes.



Partners

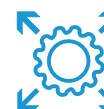
Rehoboth Town Council, Rundu Town Council, Helao Nafidi Town Council, Opuwo Town Council, Namibia



Features and functionalities

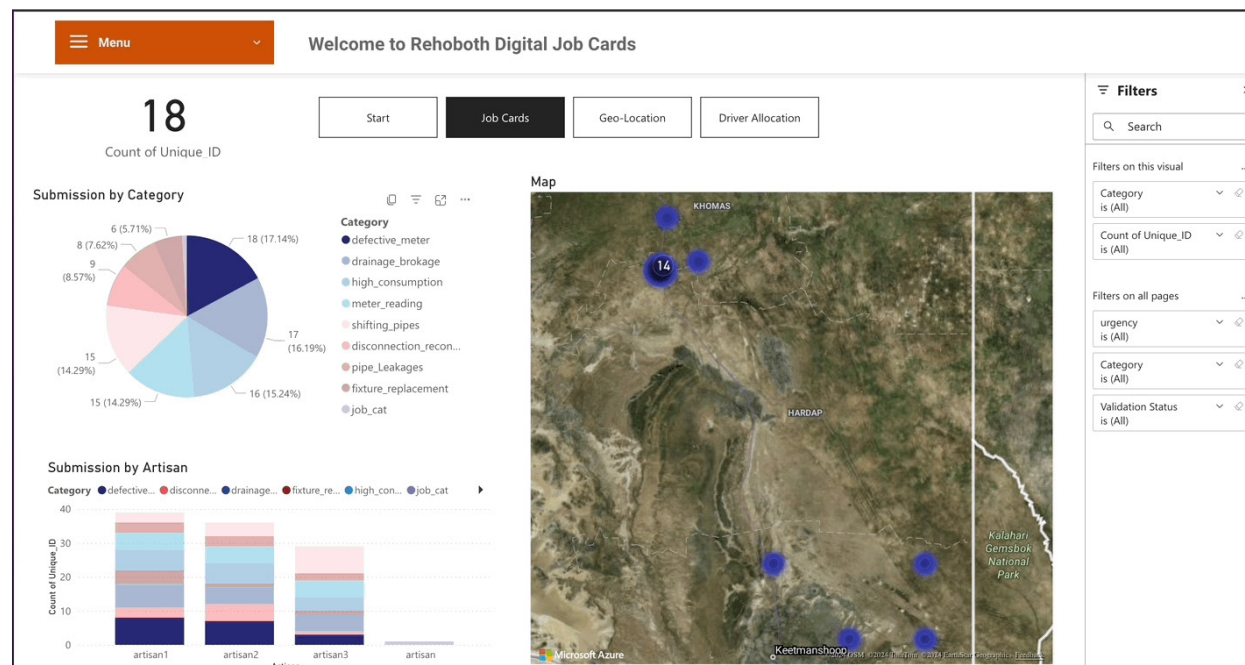
The Digital Job Card is:

- Easily customizable in a no code/low code environment
- Communicates real-time service-related requests and status updates within the local authority and with customers, assists in improving basic service delivery
- Creates access to information and service performance data which informs better urban planning and sustainable infrastructure planning



Scalability

The Digital Job Card is designed to be easily scalable within the local authority across multiple business processes, as well as with new local authorities. It allows local authorities (especially secondary towns unable to implement city scale solutions) to take one step at a time in the direction of digital tools and services. The tool is being piloted in Rehoboth Town Council and Rundu Town Council. Additionally, Helao Nafidi and Opuwo Town Council requested to adopt the tool.



Digital Job Card showing data entry on mobile app and dashboard for Rehoboth, Namibia



Dhaamiye



More info

Dhaamiye is a mobile-first water access platform that connects households without piped supply in Hargeisa to certified water vendors, improving affordability, transparency and service quality across an often fragmented market. It targets underserved settlements and IDP communities where only around 30–37% of residents have direct access to the public network and many depend on costly private vendors.

The system comprises three products: **a customer app, a vendor app, and an administrator dashboard** managed by Hargeisa Water Agency (HWA).

center. Low-tech access (USSD) supports users and vendors with limited smartphones or mobile data.

Technically, Dhaamiye follows a modular architecture with back-end/server services and mobile/front-end clients, integrating external services for mobile payments, SMS/USSD, notifications, and routing. The delivery plan covers UI/UX, iterative user testing, performance testing, CI/CD, and thorough handover. Hosting and long-term maintenance are planned on HWA server infrastructure with capacity building for local teams.

Ultimately, Dhaamiye removes middlemen, surfaces fair pricing, and shortens delivery times – particularly benefiting women who shoulder water collection – while providing HWA with valuable data to steer the city's pro-poor water services.

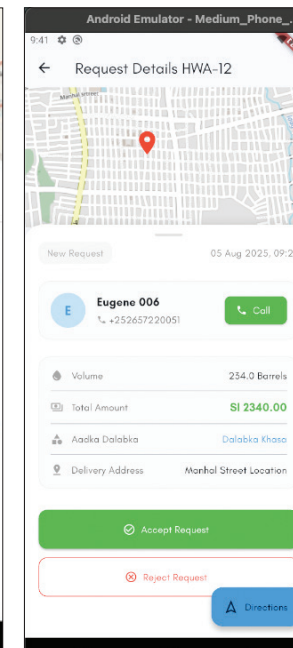
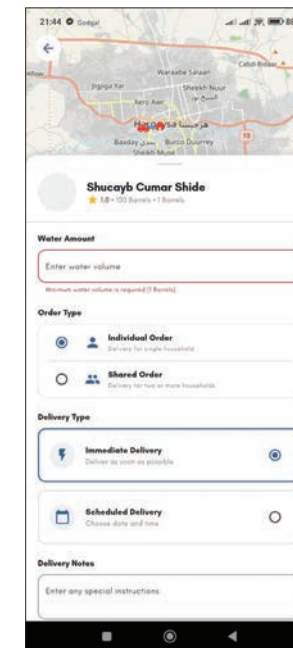
UNITAC Hamburg has led the design and development of Dhaamiye for the Hargeisa Water Agency (HWA). HWA will host and operate the platform. Field delivery is supported by a local consultant and developer, alongside structured engagement with vendor groups, telecom providers, and end users. UNITAC has also been working with UN-Habitat's Global Water Operators' Partnerships Alliance (GWOPA) to enable operator-to-operator learning and peer support.

Customers can discover nearby vendors via map/list views, see ratings and vehicle/tank capacity, place immediate or scheduled orders, track deliveries in real time, receive notifications, pay by cash or mobile wallet, and rate or report issues. Vendors manage

availability, service areas and minimums, accept/decline orders, navigate with routing support, and receive payments. The admin dashboard enables HWA to onboard and certify vendors, monitor orders, prices and transactions, handle complaints, and place phone-in orders from a call

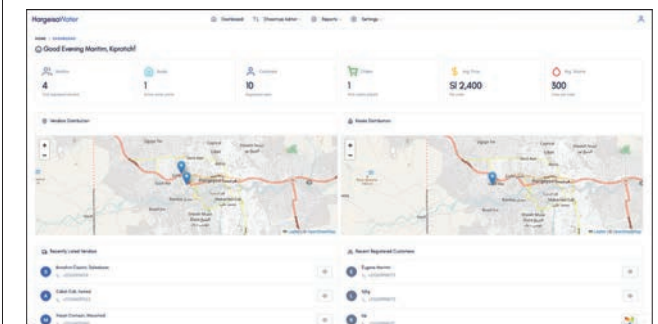


Focus group with Hargeisa water vendors



Who is it for?

- Local and national governments
- Local community and residents
- Water vendors, suppliers and operators



Left: Place orders in the user app
Middle: View order details in the vendor app
Right: Admin dashboard



Partners

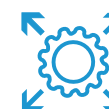
Hargeisa Water Agency (HWA), Global Water Operators' Partnerships Alliance (GWOPA)



Features and functionalities

The application will have the following features:

- User-friendly registration for water vendors and consumers (including vendor certification & user registration)
- Place water orders through mobile app
- Real-time tracking of vendor locations and delivery
- Send real-time notifications, updates, and alerts via SMS
- Secure payment (automated payment and e-receipts)
- Reports for monitoring of prices, transactions and vendors



Scalability

In the app development, many customization options have already been built in, which can facilitate upscaling, such as language and currency settings, the list of common vendor types, and different payment options.



Crisis Response & Resilience



More info

Urban Recovery Planning System (URPS)

The **Urban Recovery Planning System (URPS)** is a web-based open-source digital platform **supporting crisis response and reconstruction** efforts towards building back better. URPS is a **spatial decision support system (SDSS)** that enables users to strengthen and apply their spatial analysis expertise, complementing the capabilities of proprietary GIS software.

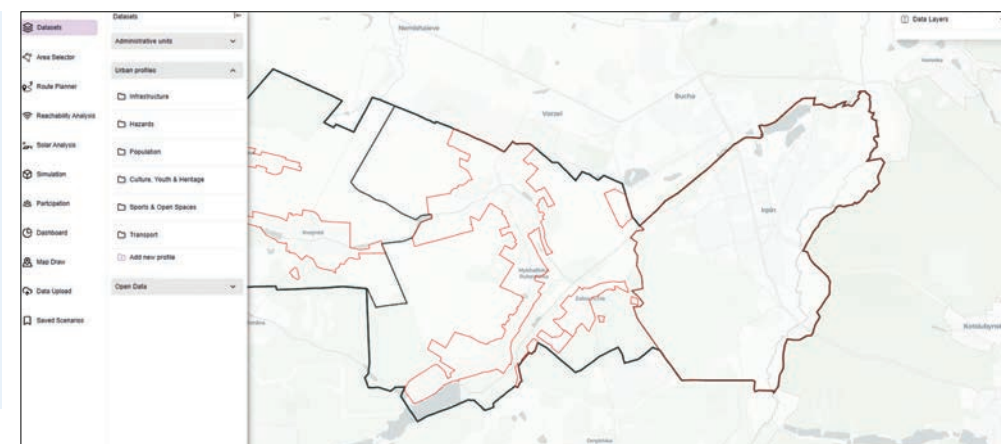
URPS provides visualization and analysis of datasets on various sectors. Planning functionalities include reachability analysis and simulation of facilities.

Based on the visualization of data, an analysis of the urban profiles helps to pinpoint critical areas for intervention, setting the stage for strategic planning and resource allocation.

Users can use the tool to **assess damage and repair levels**, as well as the availability and **provision of shelter and emergency facilities** according to population distribution.

The design of the digital tool responds to specific needs and use cases identified in crisis-affected areas, and which contribute to preparedness, response, recovery and reconstruction. URPS includes completed prototypes that support comprehensive visualization and spatial analysis, able to identify service gaps, optimize infrastructure placement, and enable hromadas officials and planners to test reconstruction scenarios before allocating resources.

The tool offers individual access to each hromada, with a personalized interface. It can also support participatory process, by allowing consultation, location-based feedback and ranking of priorities on any recovery project. Additionally, a national dashboard is designed to currently aggregate data from nine participating hromadas, tracking recovery indicators per region and sector, helping to identify communities requiring additional support or in critical conditions.



URPS interface

Who is it for?

- Local and national governments
- Urban planners and managers
- Community organizations



Stakeholders interacting with a spatial decision support system on a smart table at HafenCity Lab, Hamburg



Partners

Hromadas: Makariv, Irpin, Drohobych and Kamianets-Podilskyi.
Ministry for Communities and Territories Development of Ukraine, UN-Habitat Ukraine Country Office



Features and functionalities

Through its map-based interface, URPS will:

- Consolidate statistical, geospatial, and non-spatial data into a single platform, enabling fast, accurate, and evidence-based analysis for recovery and spatial planning.
- Allow residents to provide location-based feedback and helping local authorities rank and prioritize projects according to proximity to essential services, facilities, and other public goods.
- Reveal the social and economic value of land, connecting data on services, facilities, land use, and population groups to support fair and efficient decision-making.
- Support and simplify the development of strategic and urban planning documentation, namely the Comprehensive Recovery Plans (DRPs) and Integrated Development Concepts (IDCs) with more dynamic data visualization and analysis, moving past static maps.
- Process and visualize more than 750 datasets in Ukrainian and English



Scalability

In Ukraine, all 1,469 local governments are required to adopt geospatial data, yet many face limited capacities. The URPS tool helps bridge this gap by providing a practical and scalable solution. Its modular design and standardized data model make it easy to expand to new hromadas and sectors, while seamlessly integrating additional datasets, interfaces, or analytical features as recovery needs evolve. URPS can also be applied to support recovery efforts in other crisis-affected regions within and beyond Ukraine.



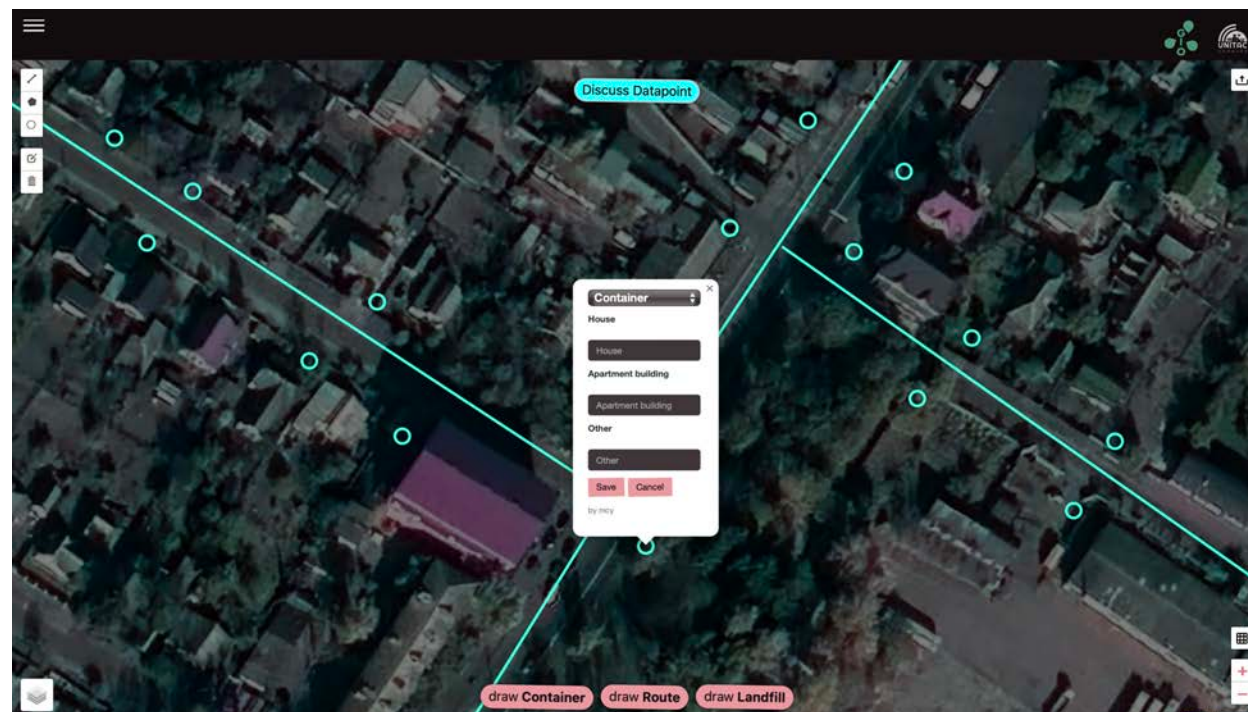
GioMap

GioMap is a web-based open-source application designed for the **visualization and collection of geospatial data**. It allows multiple (non-technical) users to collaboratively draw and edit points, lines, and polygons directly on an interactive map in real time.

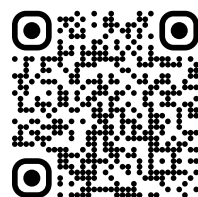
These features are automatically converted into GeoJSON files for any

spatial analysis process. The tool allows uploads of existing GeoJSON files to add or edit layers.

Designed for data-scarce settings, GioMap supports efficient information gathering and response in crisis zones or areas undergoing rapid change.



Locations of waste containers and waste collection routes plotted by data contributors during workshop with Makariv Hromada, Ukraine



More info

Who is it for?

- National, regional and local governments
- UN-Habitat teams

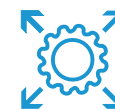


Partners

UN-Habitat Mexico, Makariv Hromada, Ukraine

Features and functionalities

- fosters real-time, multi-user collaboration, allowing teams to draw and edit geospatial data simultaneously, improving efficiency in data collection and decision-making
- provides non-technical users with the ability to contribute to data collection
- automatically converts drawn features into GeoJSON files, ensuring seamless integration of data into planning, analysis, and decision-making processes
- allows the users to upload and edit existing datasets, for data validation



Scalability

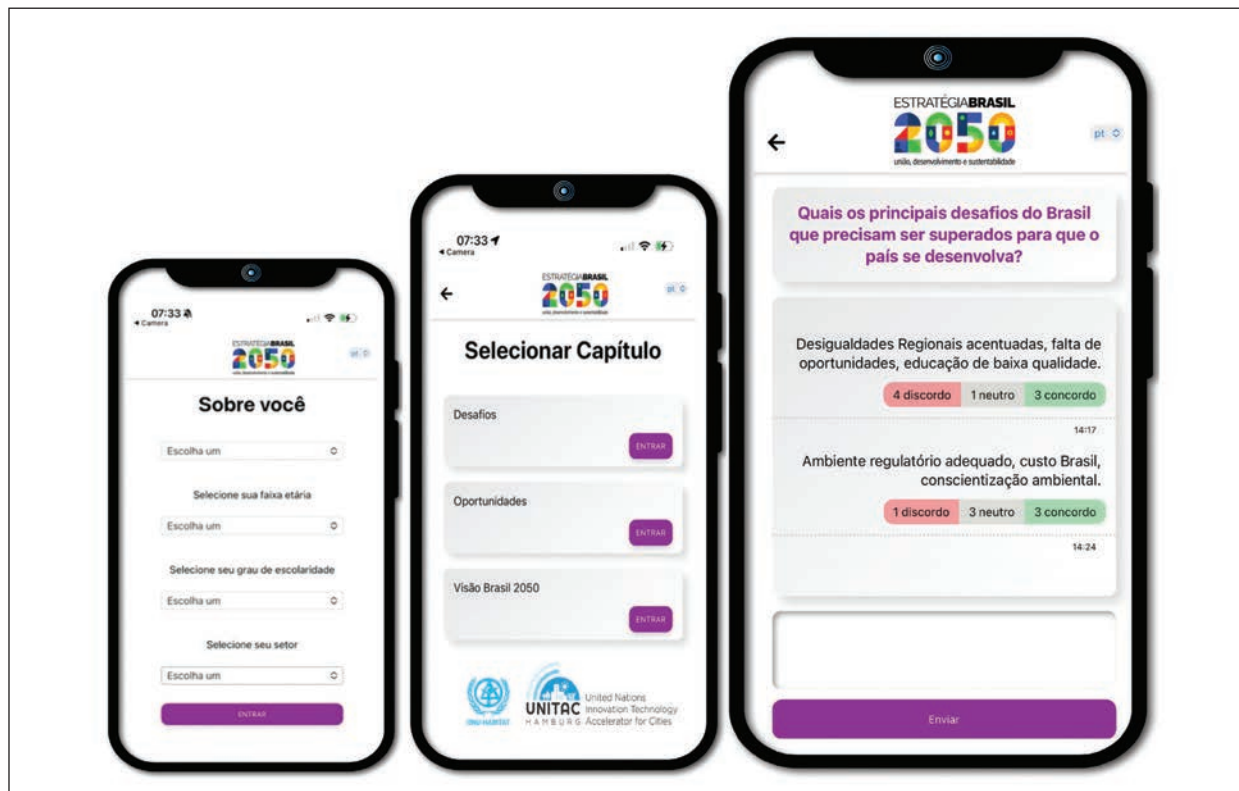
The tool has been used in workshops with participants in various locations across Central America and customized for Makariv hromada, in Ukraine, to capture geospatial information that can then be used further in planning and analysis tools, demonstrating its value in diverse geographical and socio-political contexts. It is a quick fix in data scarce environments and can facilitate rapid response in crisis zones or areas of rapid change.



User testing with Ukrainian municipalities and stakeholders at UNITAC in Hamburg. Credit: Anja Berestetska



AOVI – Real-Time Digital Participation



AOVI interface preview



More info

AOVI is a digital tool developed in collaboration with Brazil's Ministry of Planning and Budget to **foster inclusive dialogue at live events**.

Adopted in 12 workshops during the **Brazil 2050 national strategy process**, it facilitates participant engagement during discussions around key questions. Participants submit their own responses and can click to agree or disagree with others' contributions.

Advanced versions of the prototype are planned to include moderators'

access to advanced real-time data visualization: a live animated timeline of submissions that can be projected in the room, demographic filters to break down input by age, location or gender, and network visualizations to identify politically aligned subgroups and ideas, through textual analysis.

These capabilities will allow more dynamic visualization and analysis of the data collected, with responsive facilitation for organizers and admin users.



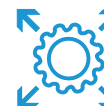
Partners

Launched in partnership with the **Ministry of Planning and Budget** (Ministério do Planejamento e Orçamento), AOVI was integrated into the process of developing the Brazil 2050 strategy – a collaborative national planning initiative led by state governments to define long-term goals around economic development, social inclusion, and sustainability.



Features and functionalities

The consultations included over **3000 participants in 12 regional workshops**. The project also built capacity within the Ministry—designing the tool alongside planning staff strengthened their skills in participatory digital engagement.



Scalability

AOVI has already been rolled out nationwide across Brazil, and plans are underway to adapt it for other national participatory initiatives.

In addition, the tool will be adapted to support challenge-driven innovation processes. Partner municipalities and stakeholders participating in the innovation project will be able to use AOVI to share ideas and comment on proposed solutions that aim to tackle urban challenges identified by the local community.



AOVI as part of the Brazil 2050 strategy process

Who is it for?

- Local and national governments
- Urban planners and managers
- Community organizations

Comprehensive Knowledge Archive Network (CKAN)



Participatory
Multilevel Governance

We use the **Comprehensive Knowledge Archive Network (CKAN)** as the foundation for our spatial data portal, helping partner organizations working across different towns in Namibia **manage and share informal settlement data** efficiently.

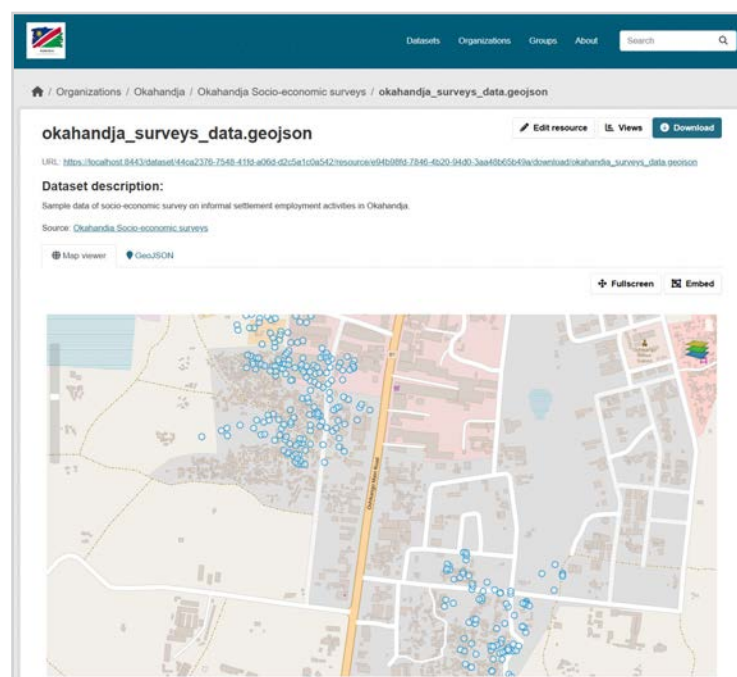
The system provides secure, role-based access, allowing organizations to store, organize, preview, and share their data. Importantly, each town can take full ownership of its data, with the ability to update information and enable contributions from organizations and the public—ensuring the data stays accurate and up to date.

Our platform connects to a central database, making it easy to create dashboards and visualizations for planning and decision-making. It handles multiple data formats and allows users to preview, download, or access data via APIs, providing flexibility for a wide range of users.

Overall, this tool empowers towns and organizations to collaborate, manage, and leverage data effectively, supporting informed decisions and better urban planning.



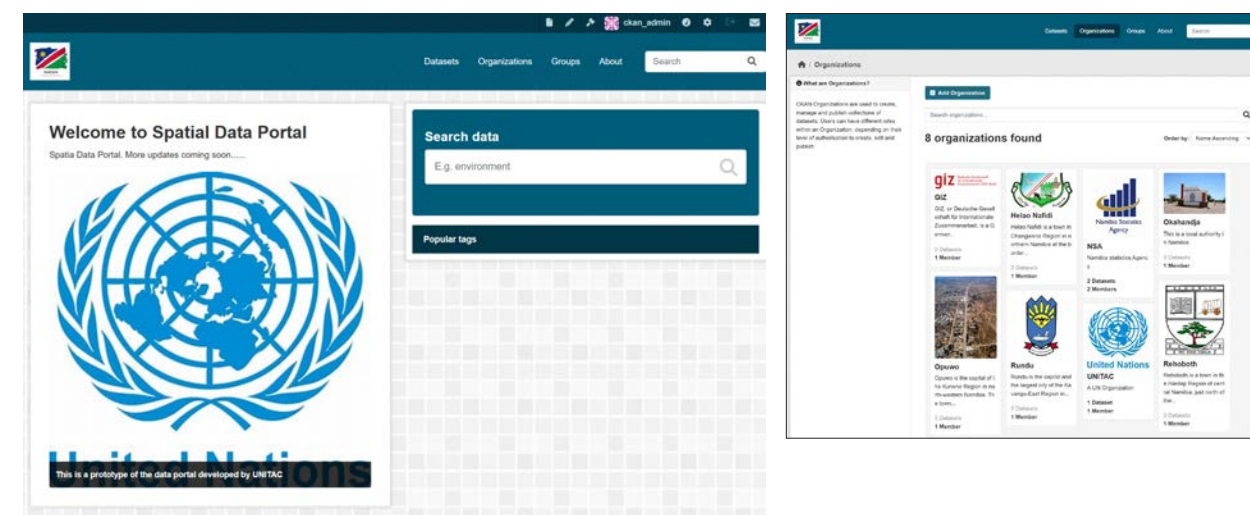
More info



CKAN interface preview

Who is it for?

- Local and national governments
- Urban planners and managers
- Community organizations



CKAN interface preview



Partners

National, sub-national, and local level stakeholders in Namibia.

Features and functionalities

The CKAN for Data Management

- centralized and standardized data storage
- ensures secure, multi-organization and multi-level data management with spatial capabilities
- fully open-source tech stacks
- can be scaled easily to any type of use-case/project
- completely Dockerized set-up for ease of deployment across different environments



Scalability

The CKAN for Data Management has been designed to be fully scalable, adaptable in other data management scenarios and use cases. The system is fully open-source and completely dockerized allowing developers to extend its functionalities or utilize its individual modules for other data management, automation or orchestration processes.



Get in touch

 unitac.un.org
 unitac@un.org

Why partner with UNITAC?



Collaborate on projects shaped by resident's needs and co-created with local partners and communities



Build skills and strengthen local capacities to develop, procure and effectively use digital technologies in an ethical and inclusive way



Advance your digital transformation strategies, frameworks, policies and processes



Enhance your urban planning, service provision or participatory governance processes by leveraging digital innovation and data