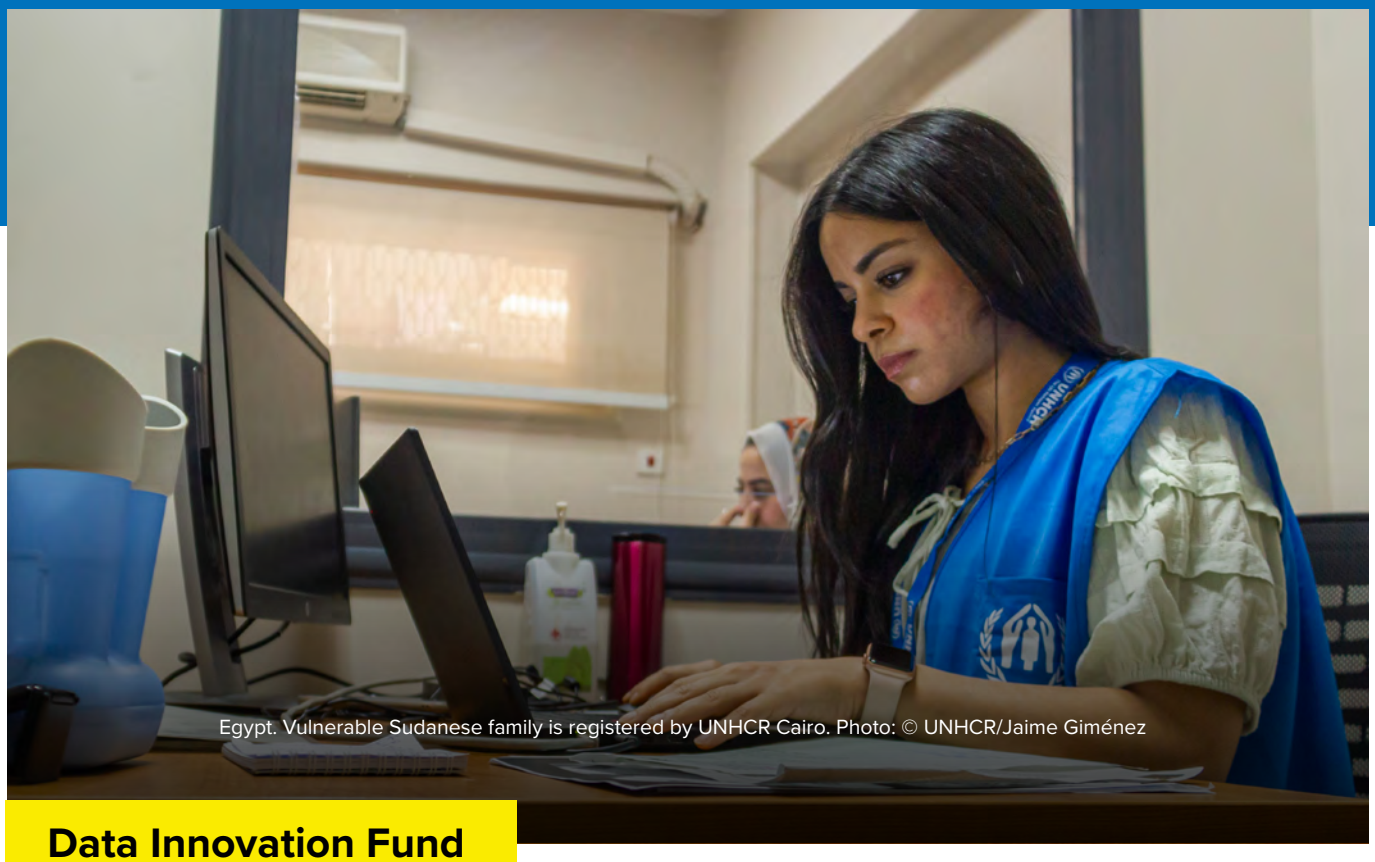
UNHCR The UN Refugee Agency | Innovation Section



Egypt. Vulnerable Sudanese family is registered by UNHCR Cairo. Photo: © UNHCR/Jaime Giménez

Data Innovation Fund

Areas of Exploration

The Data Innovation Fund aims to **leverage the acquisition, collection, storage, processing, analysis, visualization, and deletion of data to operationalize UNHCR's protection mandate**, using emerging technologies.

We strive to facilitate the appropriate adaptation of these technologies to support humanitarian work, while ensuring adherence to organizational policies, a human rights–based approach, and humanitarian ethics. The Fund supports the creation of evidence for the advancement of UN Secretariat goals, the UN Human Rights Due Diligence (HRDD) Policy, and the UNHCR Data Transformation Strategy.

The areas of exploration the Fund prioritises are aligned with the objectives of these strategies and policies. This document provides more information about these areas.

Please note, however, that the following list is not exhaustive and the Fund remains open to creative initiatives addressing other challenges identified by UNHCR colleagues alongside forcibly displaced and stateless people.

1. Tackling evidence gaps with big data or emerging technologies

Romania. Refugees from Ukraine register for Temporary Protection at the Romexpo Integrated Service Hub for refugees, established by UNHCR in Bucharest. © UNHCR/Mihai von Eremia

Tackling data gaps: How can we generate more data and evidence in humanitarian settings, leveraging new techniques, big data sources, and/or emerging technologies, such as artificial intelligence?

What this is: Projects that generate critical baseline information where little or no data exists, enabling humanitarian teams to plan, monitor, and strengthen protection and aid efforts. By leveraging big data sources, advanced analytics, and emerging technologies, such as artificial intelligence, these initiatives can uncover new insights, improve decision-making, and support more adaptive and responsive programming.

Why it matters: In many areas of humanitarian work, evidence is scarce or fragmented. Without reliable data, challenges cannot be fully understood, prioritized, or addressed. High-quality humanitarian datasets are essential for the humanitarian, peacebuilding, and development sectors to grasp the complexity of local contexts, identify people's needs, and measure the scale of issues requiring attention. Too often, available humanitarian data is incomplete, outdated, or of low quality, limiting its usefulness for statistical analysis or informed decision-making. Filling these gaps ensures more effective interventions, fosters collaboration across sectors, and strengthens accountability to affected communities.

Resources and examples:

- UNHCR Chad satellite imagery refugee enumeration areas for surveys project
- UNHCR South Africa mixed-migration route-based approach project
- UNHCR Division of International Protection (DIP) Family Reunification Data Gaps
- UNHCR Jordan Climate Vulnerability Composite Index under VAF

Transforming unprocessed data: How can we leverage big data analytics, data science techniques and methodologies, and emerging technologies to process unstructured, large-volume, and disorganized data?

What it is: Projects that clean, organize, and analyse large amounts of existing but underutilized or fragmented data. By applying advanced analytics, artificial intelligence, and other emerging technologies, these initiatives can transform raw, unstructured datasets into actionable insights that directly inform humanitarian programming, coordination, and decision-making.

Why it matters: Humanitarian actors often sit on vast amounts of raw information – from participatory assessments, interview transcripts, and operational reports – that remain unstructured, disorganized, or unused. Without the ability to process and interpret these data, valuable signals are lost, including early warnings of potential crises. This slows response efforts and reduces efficiency. Turning unprocessed data into structured evidence helps identify needs faster, improve targeting of assistance, and uncover patterns that would otherwise remain hidden. This not only strengthens the timeliness and accuracy of humanitarian action but also maximizes the value of data already being collected.

Resources and examples:

- UNHCR Mexico Data Analysis Framework
- UNHCR El Salvador Participatory Assessments Analysis with Generative AI
- UNHCR RefWorld project automatic law citations classification using AI

2. Leveraging emerging technologies to address growing humanitarian needs

Democratic Republic of the Congo. UNHCR supports IDPs in implementing measures to prevent the spread of MPOX. © UNHCR/Blaise Sanyila

Stretching limited resources further: How can we improve our protection mandate and the basic services we deliver to forcibly displaced and stateless populations in a more efficient and effective way?

What this is: Humanitarian needs continue to grow faster than available resources. Emerging technologies can be harnessed to extend the reach and efficiency of humanitarian services across sectors – for instance, protection, registration, refugee status determination (RSD), durable solutions, shelter, camp coordination, information management, and so on – so that more people in need can be assisted quickly, effectively, and at scale.

Why it matters: With rising needs and constrained resources, humanitarian actors must find smarter, more efficient ways to deliver protection and basic services. Leveraging technology like AI enables organizations to do more with limited means by expanding access, reducing duplication, and optimizing the use of staff and financial resources. Importantly, predictive analytics and other emerging technologies can help anticipate potential needs and risks, allowing

earlier interventions that prevent crises from deepening. This ensures that forcibly displaced and stateless people continue to receive essential support despite sector-wide financial pressures, while maintaining accountability and quality of assistance.

Resources and examples:

- UNHCR Malawi water-based epidemiology project
- UNHCR Division of International Protection (DIP) RSD project for detecting bottlenecks
- UNHCR Regional Bureau Europe: Ukraine returnees with agent-based modelling
- AI in migrants' and refugees' health: opportunities and risks

3. Use of artificial intelligence in humanitarian decision-making

Supporting complex decision-making under uncertainty: How can we responsibly use AI-enabled decision-support systems in humanitarian operations and affected communities?

What this is: Projects that design, test, and evaluate AI decision-support tools – e.g., forecasting, prioritization, optimization, and NLP summarization –to help humanitarians act faster and with better evidence when situations are fluid and information is incomplete. These tools are built with human oversight, transparency, uncertainty reporting, and strong data-responsibility safeguards. Also, they are designed with a human-in-the-loop (HITL) or human-in-command (HIC) approach for continuous oversight to ensure final responsibility and accountability remain with humanitarian decision-makers.

Why it matters: Humanitarian teams face fast-moving crises, fragmented data, and hard trade-offs. AI can synthesize diverse inputs and surface probabilistic insights that anticipate potential needs (e.g., displacement, disease outbreaks, supply chain bottlenecks), enabling earlier, better-targeted interventions. Used as decision-support (not automation), AI helps allocate scarce resources more equitably and efficiently while maintaining accountability, sensitivity to age, gender, and diversity (AGD) considerations, and quality of assistance.

Resources and examples:

- UNHCR Somalia: Project Jetson (anticipating numbers of IDP arrivals at admin level 1)
- UNHCR Bangladesh: Cox's Bazar operational response simulation tool for epidemics
- UNHCR Brazil: Predictive analytics and shelter simulation
- UNHCR early warning risk-modeling on climate-induced displacement
- UNHCR global early warning system on forced displacement

Augmenting space for experimentation, failure, and responsible risk-taking in humanitarian contexts: How can we create more evidence and research on emerging technologies for decision-support systems?

What this is: Building research partnerships that explore how advanced AI, including systems that move toward artificial general intelligence (AGI), could support humanitarian decision-making. AGI refers to AI systems that are more flexible than today's tools: instead of being trained for one narrow task, they can learn, adapt, and generalize across different problems, much like humans do. In humanitarian contexts, this means testing whether such systems can help navigate complex, uncertain environments and support evidence-based decisions when information is incomplete or constantly changing. All experimentation takes place with humans firmly in command: technology provides analysis and options, but people remain responsible for judgment, accountability, and final decisions.

Why it matters: Humanitarian work is full of uncertainty and difficult trade-offs, yet current evidence and tools often lag behind the speed or scale of crises. Creating a safe space for experimentation allows humanitarians and researchers to test new ideas, accept that some will fail, and learn systematically from those failures. Responsible risk-taking ensures innovation does not come at the expense of safety, ethics, or community trust. As AI evolves toward more autonomous agents, which are systems capable of taking multi-step actions, reasoning across tasks, and adapting to new situations, it is even more critical to study how these tools might support, but never replace, humanitarian decision-makers. Research partnerships can generate the evidence needed to understand both the opportunities and the risks of such systems, ensuring that autonomy remains bounded by strong safeguards and that humans stay in command of decisions affecting displaced and stateless people.

Resources and examples:

- UNHCR–UNU collaborative public policy challenge in machine learning
- UNHCR–Essex MoU in human rights, big data, and tech
- UNHCR–Omdena Foundation research on predicting forced displacement
- UNIL–University of Zurich cooperation agreement on refugee needs

4. Responsible adoption of emerging technologies

Jordan. Refugees in Zaatari Camp Receive Cash Assistance Through the E-wallet. © UNHCR/Shawkat Alharfoush

Responsible and appropriate adaptation of emerging technologies in humanitarian settings in fast-evolving technological environments: How can we adapt our UN system and UNHCR policies and frameworks, such as humanitarian principles, ethics, data protection, and human rights approaches to applications of emerging technologies?

What it is: Projects that ensure fast-evolving technologies are introduced into humanitarian work with strong ethical safeguards, anchored in humanitarian principles, human rights, and “do no harm” commitments. This means aligning new tools with existing frameworks while also adapting those frameworks to respond to novel risks, such as bias, opacity, misuse, or erosion of trust.

Why it matters: Emerging technologies can accelerate humanitarian response and extend services, but if adopted without care, they risk amplifying inequalities, exposing sensitive data, or undermining the rights of displaced and stateless people. Responsible adoption ensures that innovation strengthens, rather than compromises, protection and assistance. By embedding human rights, humanitarian principles, data responsibility, safety, cybersecurity, and other standards into every stage of technology adoption, humanitarian organizations can maintain trust, uphold principles, and create space for innovation that is safe, inclusive, and aligned with long-term humanitarian and human rights goals.

Resources and examples:

- UNHCR Global Data Service synthetic data project
- UNHCR: Explainability of humanitarian AI a matter of [humanitarian] principles
- Effects of data ambiguity and cognitive biases on the interpretability of machine learning models in humanitarian decision making

Projects that promote co-design, local expertise, community-based, and refugee-led innovation: How can we decentralize and shift power dynamics in designing projects with emerging technologies, giving leadership to the communities most affected by them?

What it is: Projects that place refugees, displaced people, and host communities at the center of innovation. Through co-design, local expertise, and refugee-led initiatives, emerging technologies are shaped to meet real needs, respect context, and reflect the lived experiences of those they impact. This approach recognizes communities not only as beneficiaries but as leaders, innovators, and decision-makers in humanitarian technology projects.

Why it matters: Designing technology without the participation of those it affects risks irrelevance, harm, or reinforcing existing inequalities. Principles such as “nothing about us without us”, cited in the Global Compact on Refugees (GCR), remind us that solutions, including technology-based ones, are stronger, fairer, and more sustainable when communities have agency. Co-design and refugee-led/community-based innovation redistribute power, strengthen trust, and ensure that emerging technologies enhance protection and dignity rather than impose external agendas.

Resources and examples:

- Empowering Refugee Claimants and Their Lawyers: Using Machine Learning to Examine Decision-Making in Refugee Law
- UNHCR Iraq: Kurdish transcription project using large (local) language models
- UNHCR Panama: Indigenous women mappers

Documenting evidence on the impact of technology investments: How do we know and quantify if we are making the right investments in software, technology procurement, and development?

What it is: Projects that generate solid, transparent evidence on whether and how technology delivers real impact and value in humanitarian settings. This includes assessing not only efficiency gains but also equity, accessibility, sustainability, and alignment with humanitarian principles. Research that rigorously evaluates AI tools, especially predictive models, natural-language processing (NLP), generative AI, or autonomous agents, deployed in humanitarian settings. This involves measuring not just technical performance (accuracy, speed) but also ethical, protection, and human rights outcomes, unintended risks (bias, opacity, wrong recommendations), contextual conditions, cost effectiveness, and sustainability.

Why it matters: With growing needs and shrinking resources, every investment must demonstrate clear value. Technology carries financial, operational, and ethical costs. Without robust evidence, there is a risk of wasted resources or unintended harm. Documenting impact helps ensure that scarce funds are directed toward tools that genuinely improve protection and assistance, strengthen accountability, and maximize benefits for displaced and stateless people. Documenting impact helps ensure that investments in AI lead to real improvements. Clear evidence also allows aid organizations to understand where autonomous tools work, what trade-offs are involved, and how to safely scale, while preserving accountability, protection, and human dignity.

Resources and examples:

- Research on machine learning in humanitarian settings
- How humanitarians are using AI in 2025
- Evaluating AI chatbots for gender-based violence support

5. Emerging technologies policy, governance, and research

Haneen Jarrar, Senior Registration Assistant for UNHCR Jordan, renews asylum-seeker certificates for refugees who have applied remotely. © UNHCR/Lilly Carlisle

Research on governance of emerging technologies: How can we support policy inputs, guidance, and research towards national, regional, and global governance of emerging technologies, particularly AI, from humanitarian contexts?

What it is: Projects that generate evidence, analysis, and policy guidance to ensure that AI and other emerging technologies are governed responsibly in humanitarian settings. This includes embedding humanitarian principles, human rights standards, and accountability mechanisms into national, regional, and global governance frameworks, while also strengthening internal UN and UNHCR guidance.

Why it matters: Global governance debates on AI and other emerging technologies are accelerating, yet humanitarian perspectives are often underrepresented. Without input from humanitarian contexts, policies may overlook the needs and rights of forcibly displaced and stateless people. Strengthening governance ensures that innovation reduces risks rather than creating new vulnerabilities, safeguards dignity and equity, and gives humanitarians a voice in shaping the rules that will define how technologies are applied in crises.

Resources and examples:

- UNHCR inter-agency chatbot on HR knowledge management: UniFyHR
- UNESCO on gender and AI
- UNICEF policy guidance on AI for children

Addressing research gaps on the application of data and emerging technologies to humanitarian contexts: How can responsible AI be applied in fragile humanitarian contexts to support decision-making, while ensuring human oversight and safeguarding affected communities?

What it is: Projects that focus on advancing research into the responsible application of AI and other emerging technologies in humanitarian contexts. The aim is not only to explore what these technologies can achieve, but also to test how academic theories of responsible AI, such as fairness, accountability, transparency, human oversight, and value alignment can be operationalized in crises. By bringing research partnerships closer to field realities, these projects help translate abstract principles into concrete safeguards that can guide practice in environments where risks and stakes are extremely high.

Why it matters: Humanitarian contexts are often marked by fragile infrastructures, scarce resources, and high-stakes decisions that directly impact vulnerable populations. Without clear evidence on how to responsibly apply AI in these settings, there is a risk of reinforcing existing inequalities, compromising trust, or causing unintended harm. Addressing this research gap ensures that emerging technologies are used not only for efficiency but also with a human rights-based approach, with strong safeguards that prioritize human dignity and community protection. This matters because it enables life-saving decisions to be informed by data while ensuring that affected communities remain protected, respected, and meaningfully included in the processes that affect them.

Resources and examples:

- UNHCR Division of International Protection Country of Origin AI Information Research
- Group fairness in dynamic refugee assignment
- AI and resettlement of refugees: Implications for fundamental rights

6. Disruptive humanitarian innovation

Drone footage of the effects of floods on Dadaab refugee camps. © UNHCR/Lilly Carlisle

Testing bold, forward-looking ideas or breakthrough technologies: What other emerging technologies should we test to create innovations in humanitarian contexts?

What it is: Testing the use of groundbreaking emerging technologies or approaches with the potential to transform humanitarian response in ways that align with global UN priorities. This includes breakthrough tools or systems. For example, innovations that support anticipatory action, accelerate protection, reshape displacement response or settlement, integrate climate resilience, or radically improve connectivity and inclusion, especially in the UN 2.0 Quintet of Change areas.

Why it matters: In rapidly shifting crises, be they driven by climate, conflict, pandemics, or forced displacement, incremental improvements are often insufficient. Disruptive innovations offer the possibility of leapfrogging existing limitations – doing more with less, reaching further faster, and being more adaptive. The UN 2.0 areas (Behavioural Science, Strategic Futures Foresight, Data, Innovation, Digital), remind us that without experimenting and investing boldly, there's a risk the sector becomes stuck, while emerging challenges and groundbreaking technologies surpass us.

Resources and examples:

- UNHCR WASH Internet of Things (IoT) water distribution project
- UNHCR Niger mapping project with drone imagery
- UNHCR Brazil BeSci-based refugee integration strategy
- UNHCR BeSci to enhance advocacy with sports fans

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