UAS Humanitarian Operations, Challenges and Opportunities

ICAO Regional Offices - UAS/RPAS Workshop

04 November 2025

WFP
World Food Programme

SAVING LIVES
CHANGING LIVES

About WFP

WFP Supply Chain & Delivery

PLAN	PROCURE	TRANSPORT	STORE	DELIVER
Sourcing & Delivery planning	Food	Ocean	Warehousing	In-kind distribution Cooperating Partners
Logistics network design	Goods & Services	Land	Prepositioning	Cash & Vouchers transfers Direct to Beneficiaries
Optimization of operations	Cash & Vouchers	**Aviation**	Humanitarian response hubs	Service Provision National Gov't Capacity Strengthening

WFP Aviation Service
Vision and Objectives

Provide aviation service

Common service
(United Nations Humanitarian Air Service - UNHAS) **including UAS**

Global On-demand and Specialized service
for humanitarian and development organizations **including UAS**;

Act as a facilitator in humanitarian response

Promote collaboration between aviation and humanitarian stakeholders;

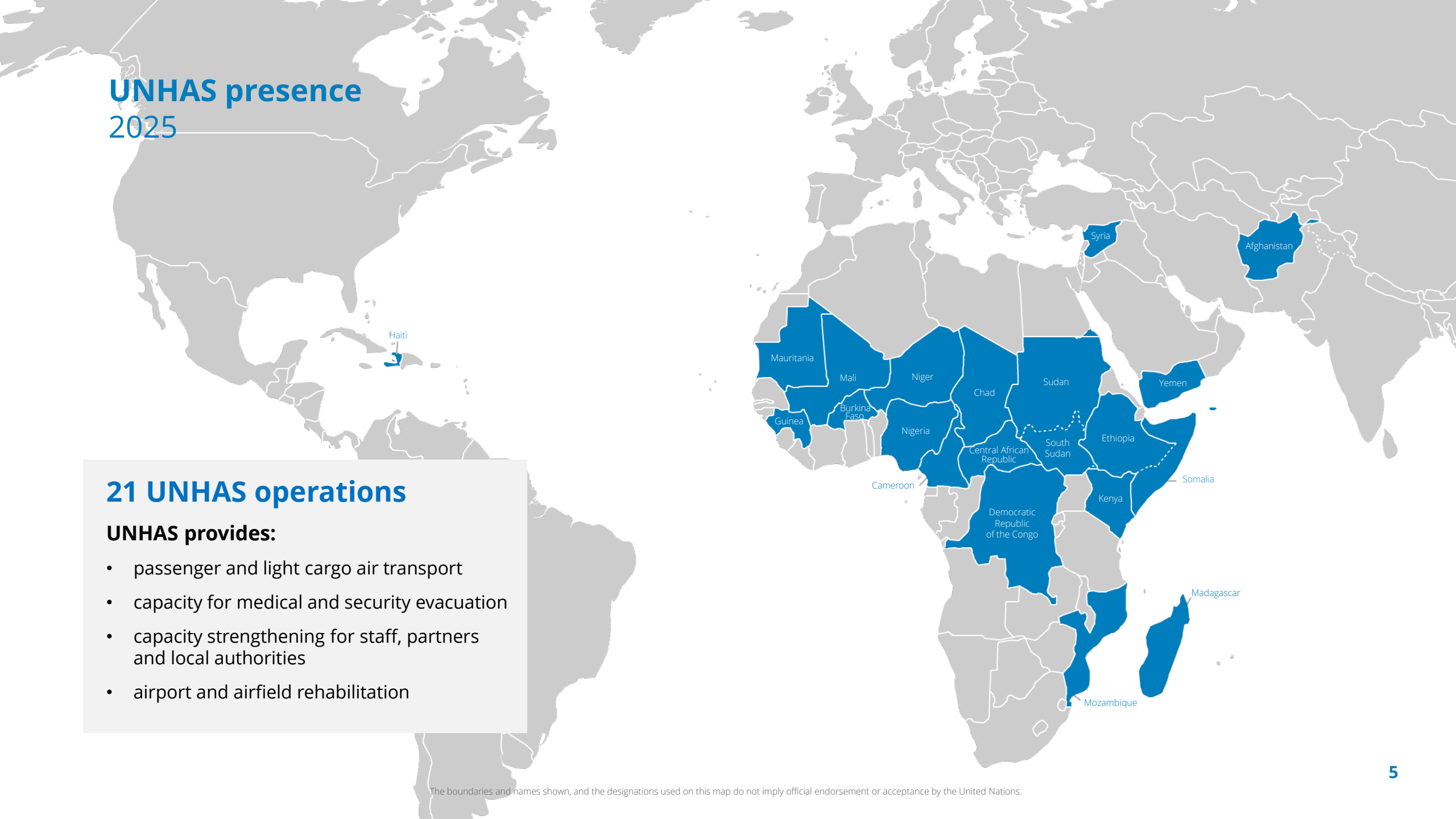
Ensure **systematic communication and coordination** among aviation and humanitarian actors.

Strengthen Aviation Systems and Capacity at the Regional and National Levels

Collaborate with international aviation organizations and regulators;

Strengthen partnerships with humanitarian and development actors.

UNHAS presence
2025



21 UNHAS operations

UNHAS provides:

- passenger and light cargo air transport
- capacity for medical and security evacuation
- capacity strengthening for staff, partners and local authorities
- airport and airfield rehabilitation

UAS in Humanitarian Operations

Humanitarian UAS segmentation

- Data collection and communication
- Small Cargo delivery
- Mid-size Cargo delivery
- Heavy-lift Cargo delivery

Data collection and communication

- Big variety of applications: security, development status assessment, damage assessment, communication, engineering, etc.
- Big variety of available UAS and operators for any applications
- Safety can be significantly accommodated by mass / speed limitation
- Requires strong data management, data protection
- Can be easily used for improper purposes and easy to hack
- Difficult business case (cost vs benefit) and often used as mission tool

Small
Cargo delivery

1-5 kg of cargo delivery for 100 km

The easiest business case definition in cases of urgent medical delivery

High impact from weather and long-distance communication

Difficult diversity of delivery for non urgent cargo

Requires primary safety risk assessment

Mid-size Cargo delivery

5-100 kg of cargo delivery

Too big for urgent, too small for non-urgent deliveries in humanitarian applications

Big offering from UAS manufacturers mostly for non-humanitarian applications

Very high cost per kg of delivery

Heavy-lift Cargo delivery

100+ kg of cargo for 200+ km of distance

The scaling allows first approximation to helicopter delivery cost in terms of USD/kg

Allows various cargos to be delivered as one package

Requires significant UAS regulation development

Requires significant Safety evaluation process and compliance

Pioneering Humanitarian Heavy-lift Cargo UAS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Why Madagascar?

- Country has predictable humanitarian need
- Humanitarian volume per delivery in 100s of kg, not in MTs
- Main challenge is roads deterioration due to flooding
- Minimum security challenges
- Low population density
- Low air traffic
- Availability of UAS civil regulation

What is the use case?

- Delivery need from 80 to 160 kg per destination
- Delivery can combine several items like special food supplement, medical supply, seeds, etc.
- This allows combination of several humanitarian actors for one delivery
- Efficiency is mainly the difference between unpredictable time / cost and stable cost / predictable time for UAS delivery

Required pre-work

- Development of basic UAS civil regulation
- CAA familiarization with ICAO concept for RPAS and UAS through, for example, ICAO UAS iPack
- Understanding that UAS is not handled via ICAO SARPS and familiarization with UAS concepts of safety evaluation like JARUS SORA
- UAS positioning in the country that includes sequential VLOS / BVLOS authorizations with required geographical and altitude parameters
- Safety / security assessment for operational base

Recurrent work

- Preflight assessment of path to destination
- Preflight assessment of availability of drop zone and drop pattern and descend to drop zone
- Training for drop zone coordination
- Engagement with local community
- Weather forecast for entire flight
- Each flight clearance with Civil Aviation authority
- Empty pre-flight to drop zone for flight validation

Actual flight

- Security clearance for operational base
- Weather forecast and actual weather monitoring during the flight
- Correct communication sequence with Drop zone coordinator
- Drop is aborted is any safety conditions are not met
- **Operation of 160 kg humanitarian cargo delivery with airdrop for 200 km range has started in Madagascar from Feb 2025**

Challenges and next steps

- Conversion of UAS definitions into CAA working concept:
  - Type Certificate
  - Continues airworthiness
  - Approved Training organization
  - CPL Type rating for UAS
  - Safety definition and assessment
  - etc.
- Actual local weather monitoring (weather avoidance)
- C2 (command and control) latency enroute

UAS opportunities for cargo humanitarian operations

Increase flexibility of supply chain where it improves the last mile delivery

Ability to deliver at the **cost competitive** to other air delivery options

Predictable and reduced delivery time to isolated locations

Reduction of security threat for aid workers

Ability to provide delivery **common service** to the humanitarian community

Technology **capacity building** in country (regulation, UAS pilot's community, spare parts / repair)

THANK YOU

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UNHAS

Humanitarian
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