

Drone delivery programme planning and implementation checklist for partners

Indicator	Method of identifying the indicator	Stakeholder involvement	What if an indicator doesn't exist?	Useful guidance resources (please note that the materials have been developed by a number of different development partners and organizations - these are all publicly available resources)
STEP 1.1.* Understanding the conditions of the drone-conducive environment and how to enable them				
Regulatory regime enabling safe Beyond Visual Line of Sight (BVLOS) flights in country's territory and allowing approval of drone delivery operations	Review of regulations, consultations with local civil aviation authority (CAA), identification of requirements and processes needed to commence BVLOS operations. Importation requirements for equipment and shipping regulations for batteries must also be verified to identify potential bottlenecks.	CAA (in some instances, ministry of defence, communications regulatory authority, military)	Engage stakeholders to start the development of regulation by building local capacity, adapting international standards and establishing areas such as regulatory sandboxes for phased implementation approach. For importation and shipment, work with revenue authorities to clarify requirements and work with technology partners and freight forwarders to come up with solutions for getting the equipment into country.	Unmanned aircraft systems: product profiles and guidance The ICAO UAS toolkit Drones (concept of drone corridors)
Funding mechanisms for long-term sustainability of the activity (who is going to fund it and own it in the long term?)	Review of funding streams that could be used to fund the kick-off of the activity and transition into regular operation, which eventually (3-5 year horizon) gets financially supported (or subsidized) by government or establishes more financial independence from donor funding. Private-public partnerships can also be considered, and local market shaping might be needed as well.	Donor organizations, relevant governmental counterparts (e.g., ministry of health) that are involved in financing the health supply chain	Engage donors to identify their funding priorities and see if there is an overlap; engage government to seek their commitment to support such activity long term	World Economic Forum: Medicine from the Sky Insight Report
Availability of local skills, expertise, and research and development	Compile a list of existing in-country drone-focused actors that have a proven record of using, building and operating drones	Drone service providers, drone manufacturers, academic institutions, non-governmental organizations (NGOs) and other relevant entities	Assess the local skills and capacity landscape and engage with local education stakeholders. Subject to demand and need, support educational programs that can improve local skills and capacity-building, which will lead to local workforce development for a future drone delivery network	The African Drone and Data Academy Flying Labs network: local expertise on drone technology
Existence of social acceptance	Proof of any past Communication for Development (C4D) drone-related activities and their results; reports, community interviews and surveys could provide evidence on social acceptance.	Ministry of information, community and tribal leaders, opinion leaders and influencers, local governance leaders, famous people	Establish a C4D protocol and engage relevant partners to initiate community sensitization activities	When the Drone Flies! Rethinking Communication Models in the Context of Innovations. (C4D models for drone innovations) Value sensitive innovation: integrating ethical values in the humanitarian use of drones
Appropriate political buy-in and potential of government to take ownership of the activity in the long term	The government's awareness about drones and their potential. Close multi-stakeholder collaboration in defining the activity from the ground up, enabling government to make an informed decision on whether drones are an efficient tool for supply chain, by providing expertise, technical assistance and other support. Hence, involvement at all levels: national, district and community. It is essential to have local champions, particularly the ministry of health, civil aviation authority, and civil protection departments - the potential core users, advocates and owners of the drone activity	Cabinet, president's office, ministry of health, ministry of transport, ministry of information and communication technology (ICT), district-level health authorities, community-level health facilities, local government and leadership, other participants in the health supply chain (private sector, NGOs)	Advocate to government about the potential of drone delivery to significantly improve health outcomes (advocacy to be based on the analysis as per the below guidance in STEP 1.2.); look for governmental counterparts that can lead/take ownership from the government's perspective (ministry of health, CAA, etc.) and support them by providing learning, capacity building opportunities and decision-making frameworks; create a national working group that includes various relevant stakeholders and enables inclusive consultation and decision-making for drone integration into supply chains	Advanced drone operations toolkit Malawi Remotely Piloted Aircraft (RPA) Toolkit Toolkit for Generating Evidence Around the Use of Unmanned Aircraft Systems (UAS) for Medical Commodity Delivery

* Step 1.1. and 1.2. can be implemented simultaneously, as they complement each other and are equally essential for the entire programme.

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STEP 1.2.* Understanding the problem that drones are expected to solve, and the context where the drones are expected to operate				
Lower than average immunization rates among hard-to-reach communities and health facilities	Different supply chains must be considered while analyzing the system design and bottlenecks: the diagnostics supply chain, immunization supply chain, regular medicines supply chain, emergency medical commodity supply chain, blood products supply chain, emergency aid supply chain, and related.	Ministry of health; subnational-level health authorities; health commodity (medicines, vaccines) and lab sample distribution supply chain participants; district-, town- and community-level health facilities; central/regional medical stores; and other participants in last-mile delivery in country	Data collection and analysis in order to identify whether the drone can help solve a challenge. Collection and analysis of the indicator data will help with answering the question "Can drones have a transformational and significant impact on the access to health commodities for hard-to-reach disadvantaged communities at scale?"	
Higher than average prevalence levels of (infectious) diseases in hard-to-reach communities and health facilities	The analysis should take the below aspects into the consideration:	(NGOs, third-party logistics [3PL] providers, etc.), academia, drone service providers		What should you deliver by unmanned aerial systems?
Higher than average frequency of stockouts at the secondary or tertiary health facilities in hard-to-reach places	1) Review/collection of geographical accessibility data and hard-to-access health facility catchment areas			
Number of medical emergencies where delivery of medicine would save a life in hard-to-reach areas	2) Review/collection of baseline data on commodity stockouts, diagnostic sample collection turnaround time, and general health indicators (disease profiles, statistics, epidemiological data, etc.)			Bi-directional drones to strengthen healthcare provision: experiences and lessons from Madagascar, Malawi and Senegal
Product storage capacity and requirements, product shelf-life at the facility level (including cold-chain storage)	3) Review/collection of vulnerability data (emergency preparedness), outlining vulnerable facilities/locations as well as their potential aid demands (types of commodities, volumes, quantities and other physical specifications).			Drone evidence generation toolkit V2
Product demand and predictability of the demand at the individual health-facility level	4) Supply chain system design analysis, taking into account a) different beneficiary community/facility accessibility, health indicators and bottlenecks of the existing supply chain that have the potential to be improved by drone delivery; b) advantages/disadvantages of different transport modalities, and current status of their service within the supply chain; c) potential efficiency (cost, time, benefit) of integrating drones; d) supply-chain performance indicators and bottlenecks, including stockout levels, delivery frequency, human and financial resources involved, operational practices			Unlocking the Lower Skies: The Costs and Benefits of Deploying Drones across Use Cases in East Africa
Financial and health value of the product				Assessing feasibility and readiness for cargo drones in health supply chains
Level of health services at the last-mile health facility to identify specific supply-chain aspects that drones could help to solve (diagnostics, blood transfusion, vaccination, emergencies, number of referrals and treatments, etc.)				Network Assessment & System Design for Transport of EID Samples and Test Results
Turnaround time of diagnostic samples for various diseases and time to diagnosis and treatment				
Geographical and access constraint indicators: 1) health-facility density and catchment areas; 2) road network quality (average speed, time, distances to health facilities using traditional modes of transport); 3) health facility accessibility (seasonality, all-year-round, specific geographic terrains)				
Service of existing transportation modalities and their efficiency in terms of time, benefits and cost				Medical commodities delivered by AAVs: Challenges and Opportunities
The elements of the existing supply chain that would benefit the most from the drone integration				
Nature and dynamic of emergencies (locations, accessibility constraints, types/quantities of emergency commodities needed)				

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STEP 2. Identifying the actual drone application, the end user and the owner of the activity

List of facilities to be served, distance to them from the hub, and their geographical coordinates, including landscape, connectivity, human resource and related characteristics	Close collaboration with the end user and key health stakeholders in defining the end solution and application to really cater to their needs and ensure coherent drone integration into their existing practices within the health supply chain system	Subnational-level medical stores, warehouses, district- and community-level health facilities, reference laboratories	Collecting sufficient data to be able to identify the application and its scope (Step 2)	Use case prioritization
Ultimate owner of the activity (district health office, national authority, or other)				
Profiles and types of commodities (weight, volume, size, substance, storage and carriage requirements, hazardousness, and other characteristics), and storage capacity on both sides: sender and recipient				
Delivery type (one way or bi-directional)				
Anticipated frequency of service in order to optimize the network of deliveries				

STEP 3: Identifying preferred solution/service and procuring it

Identification of market-available solutions that can provide appropriate services	Based on the initial analysis of demands, identifying the specific product and service that best fit the defined application	End users (as described above), service/product providers (potential list of vendors provided below)	Explore other solutions	List of drone delivery service providers and manufacturers
Identifying a vendor/service provider/technology	<p>Using competitive tendering process (Request for Proposal of Services [RFPS] or Invitation to Bid for Services [ITBS]) to identify a vendor that can provide drone-delivery services. The tendering process should focus primarily on:</p> <ol style="list-style-type: none"> 1) Identifying vendors that have a proven track record of providing similar services in a similar context on a continuous basis (at least a month of operation) 2) Ensuring the service provider has appropriate understanding and experience of the health supply chain, and health systems in general 3) Ensuring the service provider's performance is measured by output (not input), such as the number of flights and quantities of commodities delivered/picked up (considering weather and other force-majeure limitations) 4) Ensuring that the provider fully manages liabilities and responsibilities (regulatory compliances, hazardous material requirements, emergency procedures, insurance, maintenance and repairs, local staff training, operation setup, ongoing interaction with other stakeholders involved in distribution, etc.) 5) Identifying the vendor that can offer the best price-quality ratio (best value for money) 	Supply/procurement officers, program officers, vendors	-	Guidelines: Unmanned Aerial Vehicle Procurement Guide How to Select a Drone Service Provider for Transport of Health Products UNICEF Guidance on the use of drones in supply chains with annexes