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Comparative Analysis of Humanitarian UAV National Capacity Gaps

Gaps identified through workshop	Dominican Republic	Peru	Myanmar	Mozambique	Malawi
Humanitarian UAV experience	Dominican Republic is at the intermediary phase: they have deployed drones, but have limited experience	Peru is at an advanced phase: they have deployed drones and gained real-world experience	Myanmar is at the exploratory phase: they have not deployed drones	Mozambique is at the exploratory phase: they have deployed drones but only in simulation	Malawi is at the intermediate phase: they have not deployed drones but benefit from infrastructure and investment
Data analysis / data ecosystem	Desire to use imagery for preparedness and mitigation but little capacity in data analysis	Need for national data sharing platform/website and standardization of data formats, not only for response but also preparedness	Little to no capacity for data analysis, and viewed as a major constraint to effective use of imagery	Very limited connectivity requires LAN workaround; little/no capacity in data analysis and no ecosystem	Little/no capacity for data analysis in country (except possibly military); no standards or platform for sharing pre-emergency data
Regulatory environment	Strong UAV regs allow opportunity to create novel processes for lisence and registration of drones	UAV regulations need to be adapted to include emergencies; registration and activation of pilots, flight permission, and importation of UAVs	No UAV regulations exist; permission is given by local authorities & this method works, yet still pirority for national legislation	No UAV regulations at present, and lack of clarity on policy; but desire to establish a platform through key gov't positions to rectify	UAV regulations are in the process of being made law, however do not contain provisions for humanitarian response.
Expertise training & certification	Training required not just in piloting and data analysis, but also theorhetical training on integrating drones into DM protocols	Need for a standardized training curriculum for building checklists, on-site security assessment, and SOPs	Very little in-country capacity on data side, but strong academic community ready to assist in training and licensure of pilots	There does not exist any entity in Mozambique to provide much needed training in all aspects of UAV deployment	There is need for all aspects of training, but unfortunately there was not identified any training provider in-country
Integration of CoPs: UAV+DM+CAA	Desire by all to have institutionalized capacity to use drones across different industries to build capacity for DM	Need to integrate drone network into a unified platform of emergency agencies of government	Lack of understanding between CoPs and very little communication hampered communication around info needs/requirements	Follow-up meetings to be held between UAV and DM communities to take coordination forward	The workshop cultivated buy-in from all CoPs, which needs to be sustained and integrated into an actual response; the UAV/data CoP needs strengthening
Inventory of UAV assets for response	Gov't agencies wish to have this for response planning	Need for national roster of pilots that are lisenced or at least vetted by some process	Need for roster of both pilots and data analysts, though uncertainty who should lead	CAA expressed desire to maintain a roster or database of pilots	The need to create a roster of pilots and analysts was expressed but no one volunteered to tackle it
Tasking mechanism and SOPs	Working mechanism, but no standardized approach; viewed as vital to the timely deployment of UAV in a response	Lack of any SOPs to guide process, but also lack means to activate pilots; Pilots also lack checklists to ensure uniformity and safety	No working mechanism but recognized need for better understanding to develop SOPs through a technical group	Desire to have MOU for deployment procedures; desire to identify means to co-locate pilots and analysts during mission	Pilots expressed a strong preference to identify a clear tasking mechanism as one does not presently exist
Customs & Importation for equipment	Emergency procedures must include drones and related equipment	Recognized need to develop a protocol for importation of foreign UAVs into country in an emergency	Difficult to import UAVs; customs and importation seen as following any UAV regulation work	Limited availability to purchase UAVs in country and no mechanism for importation during emergency	Individual relationships/requests make feasible the importation but it is an uncertain procedure in a response
Role of academic and private sector	Academic and private sector already well invested in UAV technology and eager for role in DM	Need for research into best practices and lesson learning of deployments	Strong capacity for UAVS in DRR community, and this can be leveraged if partnerships made	No relationship between DM and private sector at present but desire to establish	Seemingly no relationship with academia; private sector has an active role in the CoP

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Tasking & Communication (Coord-Pilot-Analyst)	Viewed as the most important aspect to achieve timeliness and safety for integration of UAVs	In theory tasking worked well, but in practice pilots acted independent of coordinators and analysts	Lack of maps of area hampered coordination; LAN set-up to faciliate data transfer worked well but may not be replicatable	Lack of understanding and ineffective communication b/w all groups led to lost time and lack of agility to adjust changes	Effective communication between groups as a low-tech method; would not work well if all groups not located in same space
Data value chain / Information management	Information not available at time of decision making becomes useless; pilot and analysts could have done more to provide info in timely manner	Analysts used various methods. Priority should be for processed imagery and integration with GIS in way that does not prevent quick decision making.	Data analysts not able to use 'standard' analysis features like orthomosaic due to time constraints	Coordinators left out of loop due to kink in data workflow; value of UAV was not apparent to them	Data not fully/quickly shared by pilots with analysts possibly delayed the speed of response; this was due to technical and workflow problems
Imagery resolution/feature detection	High resolution unecessary for quick detection, but good for follow-up later on	Pilots tended to cut analysts out of the process by making their own interpretation which caused confusion	Processing took too long/pilots not familiar with ortho software; video and image analysis prevailed; would not have been feasible for a large size area	Too few analysts and lack of process to communicate features detected for retrieval	Quick processing speed degraded resolution of orthomosaic for sake of time, but made feature detection impossible
Overall integration of UAVs into DM	Need to modify existing DM workflows than to create entirely new ones, and workflows need to be adaptable to sudden changes	Leadership should encouraged and rewarded by coordinators; ground teams were not utilized well while pilots were collecting imagery	DM/search teams were not aquainted with tech such as GPS devices; low tech solutions required to ensure usefullness of data	Ground teams (ie. not pilots) were not effectively used/tasked while pilots were collecting data, the need for adaptable workflows would have helped	Coordinators did not task SAR teams until actionable information became available causing lost time; otherwise integration showed promise
Gaps in relation to UAV Working Group coordination pillars	**Dominican Republic**	**Peru**	**Myanmar**	**Mozambique**	**Malawi**
Technical Standards	Data analysis can benefit from better standardization, but capacity must also be built up too	There was no agreed standard for data format or sharing which caused the bulk of problems	Need for geospatial standards to be used by pilots and coordinators;	Data management standards required; diversification of platforms for data collection	Need for geospatial standsards to be used by pilots and coordinators and more widely to inform data analysis workflow
Partnership Framework	Viewed as important, but needs development and guidance	Desire to collaborate between actors but no formal mechanism exists	Strong desire to collaborate by all actors present, however recognition that military will have final say	UAV capacity in private sector/nonprofit needs to be leveraged for DM	Desire to collaborate by all CoPs however no precedent and difficult to maintain momentum
Tools and Solutions	Participants want to see tools for airspace deconfliction as well as for communication between coordinator, pilots and analysts	Although no airspace mgmt software was used, UAVs quickly grounded due to manned aircraft; could be improved to get them re-airborne faster.	Tool for connectivity required for sharing data, as well as portable electricity generation for charging batteries	Tools such as LAN for data sharing and UTM for airspace deconfliction required; templates/procedures for coordination b/w teams	Imagery processing software seen as too slow for operational needs and yet no ideas for how to work around
Community Engagement	Proceeded well; facilitated by civil protection unit who maintained safety for crowds watching	Could have been done better in advance of simulation which showed a bias towards not informing public	Community involved in Coordination and search teams was extremely useful; also local authorities gave flight permission, therefore well informed	No data	Positive outcome of engagement with community as they participated and enjoyed hosting
Advocacy	All stakeholders favour UAV adoption	Stakeholders see value in further coordination	All stakeholders favour UAV adoption, however military has final say	All stakeholders favour UAV inclusion; importance of geospatial skills needs recognition	All stakeholders favour adoption of UAVs and see further trainings and crucial to success
Policies	UAV regulations already well developed	UAV regulations at present do not have any provision for emergencies	UAV regulations in process of being developed	UAV regulations not developed; needs to include licensing and importation	UAV regulations on process to become law, but will need practical application