

Drone aerial imagery and digital terrain models as tools in resolving contested borders: The case of Zambia and the Democratic Republic of the Congo

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SUMMARY

More than 90 percent of the intra-state conflicts on the African continent in the last three decades have involved a border dispute. One of those disputes involves the border between Zambia and the Democratic Republic of the Congo which has been imprecisely defined and has led to confusion and contention between both countries for decades. Recently, both nations agreed to have a modern, accurate survey conducted to document physical features, which define a portion of the boundary line in remote and rural areas near Lake Tanganyika.

The project involves Medici Land Governance and the German development organization, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), which has been conducting an aerial imagery survey to demarcate in detail the contested border line between Zambia and Democratic Republic of the Congo. With the survey imagery, MLG is tasked with building a digital terrain model (DTM) to visualize the contested area accurately so that both countries can then proceed on a diplomatic path to resolve a long-standing dispute regarding the boundary lines. The objectives and deliverables of this project focus on delineating topographic prominences (peaks and ridges) in a remote, rural area. The process includes aerial surveys using drone aircraft and ground survey equipment, along with deriving orthoimagery and digital terrain models and conducting terrain analysis of derived digital terrain models to identify and map mountain peaks in the affected area, The project will accomplish mapping with high accuracy the summit of Mount Pungu together with summits of peaks in the Kipimbi Range of the area of interest.

The project will result in development of spatial data products, each with coverage for the entire combined area of interest. The geodata deliverables are comprehensive in nature, including coordinate reference systems, orthoimagery and digital models along with mountain summit locations, contours, and the proposed primary and secondary beaconing of the boundary line

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between the two nations. To account for complexities in the watershed boundary mapping, an analysis of the available data will narrow the region to be intensively surveyed for border dispute resolution from to a smaller, more focused area. Both countries will receive the data in preparing for the next phase of diplomatic negotiations.

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