International Medical Corps Leverages Meta's High Resolution Population Density Maps for Improved Disaster Response for ~1.7 Million across Central African Republic (CAR), India, Libya, Nigeria and Pakistan

Background

International Medical Corps relieves the suffering of those affected by conflict, disaster and disease, often in difficult and dangerous environments. They deliver vital healthcare services and training that help devastated populations move from relief to self-reliance. To aid in these crisis events across the globe, International Medical Corps developed a proprietary mapping application called "International Medical Corps Locations," designed to record GPS coordinates of where they work across the world. This location data links with other International Medical Corps systems to allow them to conduct analysis such as calculating the distance between a disaster and nearby health facilities in order to decide where to send mobile medical units or the distance from health facilities to their warehouses in order to route inventory as needed, as well as figuring out what residences their disaster team can sleep while responding to a disaster.

From Manual Review to a Semi-Automated Workflow

In early 2021, International Medical Corps discovered the advantage of adding Meta's high resolution population density data as a layer in their application to help validate their geospatial information from the field as well as identify un-mapped locations or settlements around the globe that may not be receiving aid. After International Medical Corps' country teams input a new location where they are working in their system, they use the population density data layer to determine if the map pin was placed in or near a village or settlement. These locations are frequently in extremely remote areas where web-based maps are not easily accessed or don't exist due to poor internet connectivity and/or lack of electricity. If the location entered does not intersect with the village or settlement, their system will flag that the coordinates are incorrect (in a water body or dense tree canopy, for example) and then their team will manually review.

Prior to using Meta's high resolution population density maps, the process of determining where settlements were was time consuming as International Medical Corps teams had to manually review and spot check all locations, which they could only do at a rate of ~50 locations per hour. Leveraging Meta's high resolution population density maps in Central African Republic (CAR), India, Libya, Nigeria and Pakistan, their teams are now not only more effective in identifying errors and unmapped settlements, but they can now review about 650 locations per hour -- a 13x improvement compared to the original workflow.

> *"We are pleased with how the Meta population density data takes a time-consuming review process and cuts down manual review significantly into a semi-automated review process. The population density data from Meta helps to ensure that the location of our assets and staff in the field are accurate, which allows us to provide more timely response to emergencies, aids with vaccination campaigns, assessments, and other location-based tasks."*
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> *- Kacey Pham, Manager at International Medical Corps"*

Meta's high resolution population density maps ultimately enable International Medical Corps teams to identify villages that may not have been receiving humanitarian support and more effectively and efficiently deliver aid.

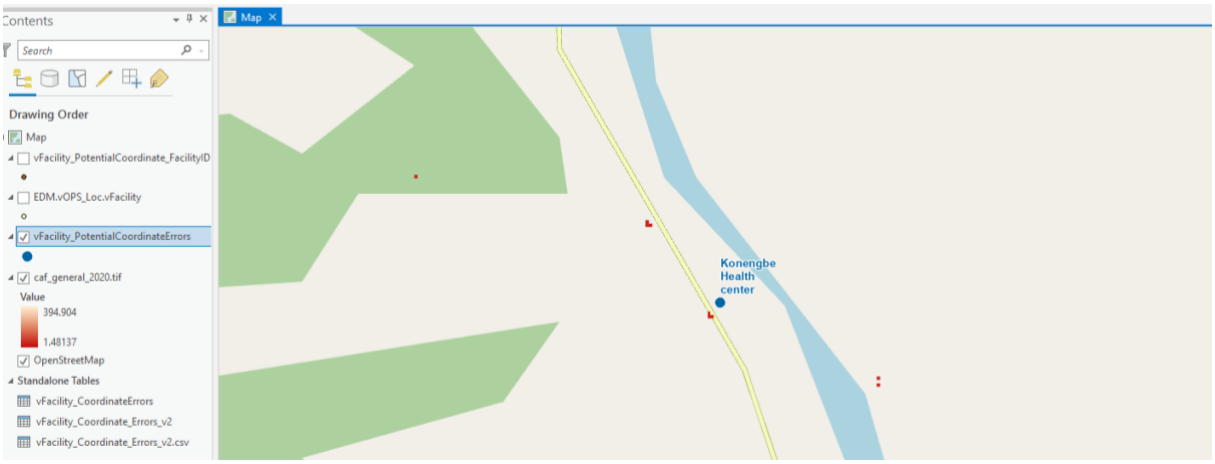
Analyzing Population Density Data in Central African Republic to Provide Lifesaving Services

One of the world's poorest countries, the Central African Republic (CAR) has been plagued with bouts of political turmoil and unrest since it won independence from France in 1960. Since the country's latest round of violence began in 2013, one in four Central Africans has been forcibly displaced. Following presidential elections in December 2020, the security situation in CAR deteriorated significantly, with increasing violence in much of the country. The country is currently under a state of health emergency declared by the president in April 2021.

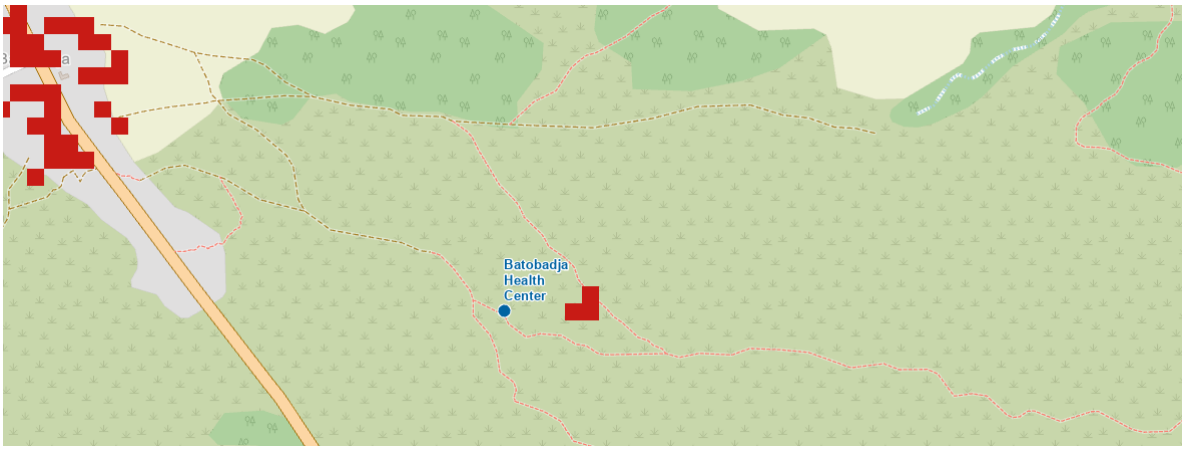
International Medical Corps has been providing lifesaving services to internally displaced persons (IDPs), refugees and conflict-affected host communities in CAR since 2007, and remains one of the few international organizations with a presence in the country's troubled northeastern region. Today, International Medical Corps provides services in the Vakaga, Haute Kotto and Ouaka regions, including basic health services, reproductive health services, counseling and testing for HIV, treatment for acute respiratory infections, psychosocial and clinical support to survivors of gender-based violence, nutrition services and treatment for malnutrition, and protection activities.

International Medical Corps teams also work closely with the Ministry of Health (MOH) and community counterparts to design, implement and evaluate programs. To build resiliency into the national health system and ensure the long-term quality of care and services, International Medical Corps provides ongoing training and supervision for health and community actors, as well as for MOH staff. It's imperative that International Medical Corps has accurate location data to keep their teams and assets safe as well as to ultimately deliver needed disaster relief services to beneficiaries.

To analyze population data for CAR, International Medical Corps extracts general population geotiffs from Meta on the Humanitarian Data Exchange. They then convert the files into point feature classes and load them into Microsoft SQL Server by utilizing the Esri Arcpy library and visualize them in Esri ArcPro.



Through geospatial analysis, International Medical Corps found 40 of their locations (37 health facilities, one warehouse, one office and one residence) in CAR did not overlap with Meta population density data and thus needed to be further investigated to ensure disaster relief services could be delivered. They reviewed these locations and found that 38 locations were in fact erroneous data entries due to user error and internet connectivity issues. The two additional locations were areas not previously mapped and not available on building footprint vector basemaps or on publicly available satellite imagery basemaps.



In the example above, the GPS coordinates for the health center were flagged for a manual review since they did not line up directly with the population density data. At first glance using a standard web-based map, the hospital appears to be in the middle of a heavily forested area. This generally creates confusion over accuracy, but with the help of Meta's population density dataset they were able to quickly verify that the health center location is indeed accurate. Furthermore, International Medical Corps extracted population figures to better understand the number of people served by this health facility, which helps inform their response plan.

Overall, these improved processes have helped International Medical Corps more efficiently and effectively deliver health care and related humanitarian services for approximately 1.7 million people across CAR (~400K), India (~84K), Libya (~98K), Nigeria (~803K) and Pakistan (~296K).