

Using High Resolution Satellite Imagery & GIS Technology to Strengthen Microplans–Perception and Accurate Mapping

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Introduction

In response to a 2018 Polio outbreak in Papua New Guinea (PNG), CDC supported the World Health Organization pilot project in the Fall of 2019 to evaluate the use of high resolution satellite imagery and GIS technologies to strengthen immunization microplanning. Prior to our visit, we prepared maps of 46 Local Level Governments (Admin level 3) in Central and Morobe Provinces using existing public data of health facilities, villages, boundaries and roads. We presented these maps to 71 health officials at two workshops in August 2019. Health officials marked up the maps and digitized the data using ArcGIS Online with satellite imagery. Health officials digitized 1,365 health facilities as points and 106 health facility catchment areas and 477 team areas as polygons.

When we arrived in country, we began searching for additional data before the workshops began and were very surprised to see that the health officials in Morobe Province created hand drawn maps of their health facilities and catchment areas. The hand drawn map (Figure 1) is one example. This map covers the Lablab Health Center and catchment area. Unfortunately, the author is currently unknown.

This map is very attractive and provides details on villages, aid posts (small immediate care health facilities), schools, roads, tracks, bridges, wet crossings, and catchment area boundaries referred to as main clinic points or hamlets with main clinic points in the key. With these details and the selected colors, it is clear that great detail of thought, concentration, knowledge, and pride went into this map. The map is very readable and easy to interpret.

Perception and Accurate mapping

After the workshop, we compared the hand drawn map to the GIS generated map shown in Figure 2 and found issues with scale and direction in the hand drawn map. The focal point of the maps is the Lablab Health Center labeled with a ①. Sakar Island and its aid post labeled ② and Malai Island and aid post labeled ③ are in opposite directions in the GIS map as compared to the hand drawn map. The Tongso Village is located close to the LabLab Health Center in both maps. The distance in the hand drawn map between the Lablab Health Center and the Tongso Village location is not too different than the distance from the Lablab Health Center to Sakar and Malia Islands in the hand drawn map. In actuality, Sakar and Malia Islands are 33 and 23 km away from the health center while Tongso Village is 0.8 km away. Additional scale and direction issues are seen with the villages of Marile ⑥, Kampalap ⑦, and Kabi ⑧ and the airstrip ⑤ in the hand drawn map.

While scale and direction are not accurate in the hand drawn map, the hand drawn map does provide a level of detail the GIS map does not. Future work needs to improve the digital capture of the hand drawn data.

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Figure 1. Hand Drawn Map

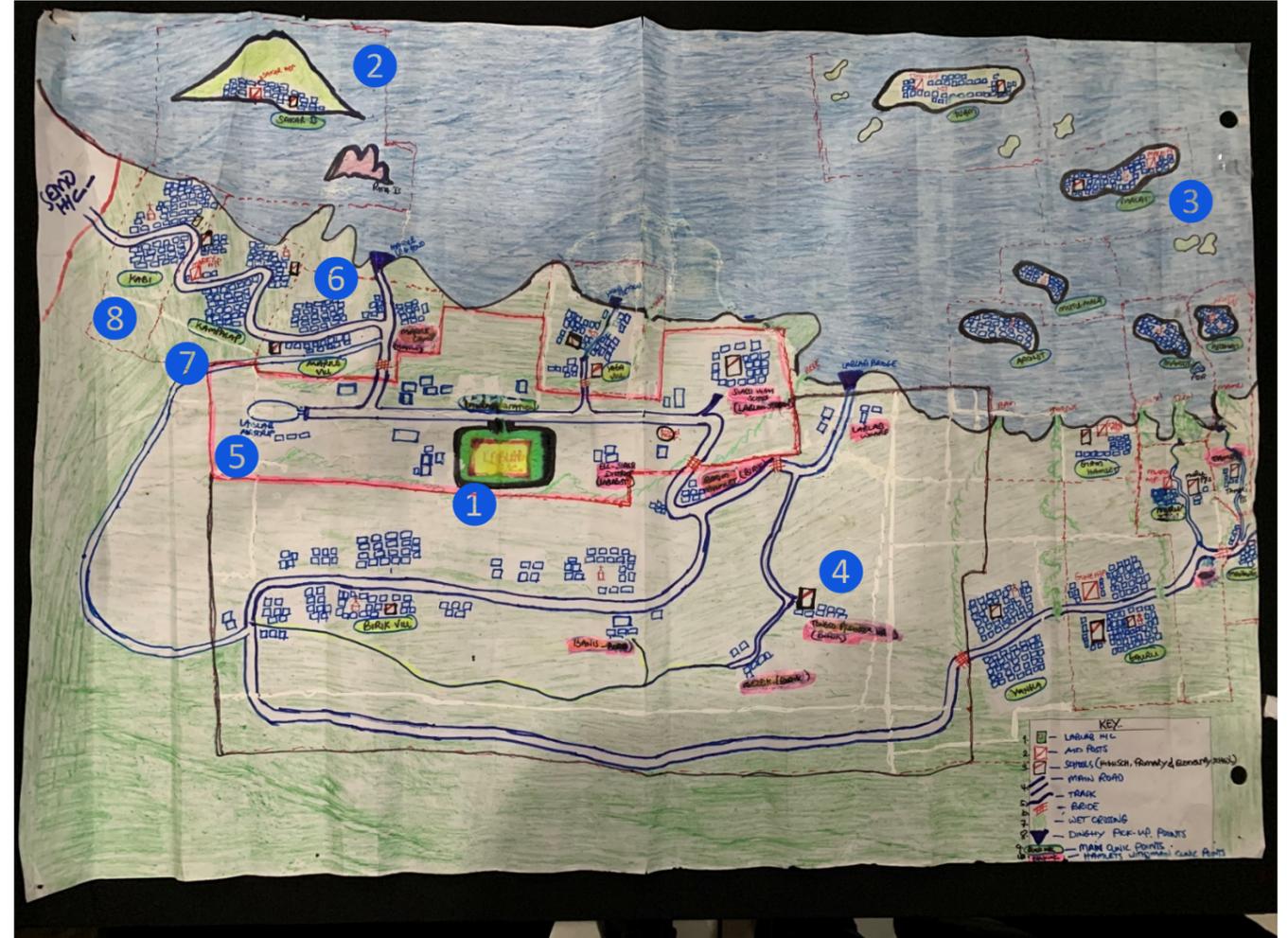
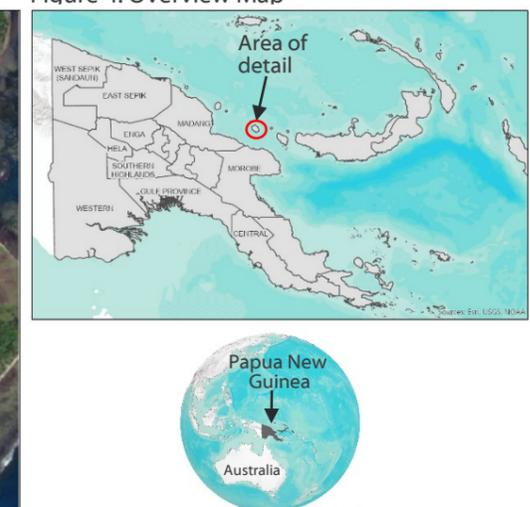


Figure 3. Close Up of Lablab Village and Area



Figure 4. Overview Map



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Figure 2. GIS Map

