

Simex: Use of geospatial tools for Campaign Digitization

2025 Alliance for Malaria Prevention Annual Partners Meeting and Campaign Digitalization Meeting

The session aims to support effective planning, resource estimation for implementation of preventive interventions for malaria control, integrating modern tools and techniques for geo-enablement: satellite imagery, GIS data and analytics to strengthen malaria prevention efforts.

Agenda

Session 1 (30 minutes):

Microplan and Geo Enablement: Country Experiences

Sharing country experiences on implementing microplanning and enablement strategies.

Facilitator: WHO GISC

Session 2 (1 hour 45 minutes):

Practical Data and Analysis for Malaria Prevention

Hands-on demonstration of using satellite imagery, building footprints, population data, and accessibility analysis to digitalize health facilities and delineate catchment areas.

Facilitator: GISC + Participants

Session 3 (30 minutes):

Resource Estimation Exercise

Collaborative exercise focused on estimating resources needed for effective malaria prevention interventions.

Facilitator: GISC + Participants

Session 4 (15 minutes):

Discussion and Q&A

Open forum to discuss malaria control programs, including preventive interventions like bed-net distribution and vaccination campaigns, along with challenges and expectations from geo-enabled microplanning.

Facilitator: Participants

Microplan and Geo-enablement : Country Experiences

The Alliance for Malaria Prevention Annual Partners Meeting and Campaign Digitalization Meeting
Mövenpick Hotels & Residence
Nairobi, Kenya from 7 - 11 April 2025

WHO GIS Centre for Health

Established in May 2022

Meet the WHO GIS Centre for Health team

Row 1: Ana (GIS specialist, project facilitator), Anare (GIS specialist), Annette (GIS specialist), Antoni (Information management officer), Asela (GIS specialist and data expert), Bodour (Project facilitator), Brian (Geospatial expert), Cam (GIS specialist), Catherine (Project facilitator), Daniel (GIS server expert), Denise (Monitoring and evaluation).

Row 2: Francis (GIS specialist), Gédéon (GIS specialist), Heritier (Information management officer & GIS specialist), Ian (GIS specialist), Inge (Training and capacity development specialist), Iqbal (Information management officer & GIS specialist), Jaouad (GIS specialist, project facilitator), Jerome (Information management officer), Jing (Product manager), Jo (GIS specialist), Jon (Partnerships).

Row 3: Juan (GIS specialist), Julia (Conceptual data architect), Kerry (Geospatial health specialist), Kshitij (Web and IT specialist), Luis (Information management officer), Kt (Cartographer), Michele (Information management officer & GIS specialist), Mona (Project facilitator), Mwenya (Secretariat support), Nadika (Geospatial health analyst), Nomsa (Business analyst), Oluwaseun (GIS specialist).

Row 4: Onur (Health data analyst), Prashant (GIS specialist, project facilitator), Ravi Shankar (GIS team lead), Reut (GIS specialist), Ronald (GIS specialist), Ryan (GIS specialist), Samuel A (GIS specialist, project facilitator), Samuel O (GIS specialist, project facilitator), Sanjay (GIS specialist, project facilitator), Tamer (GIS specialist, project facilitator), Yamiko (GIS specialist), Ye Lin (GIS specialist).

 **World Health Organization**

  **SCAN ME TO LEARN MORE**
www.who.int/data/gis

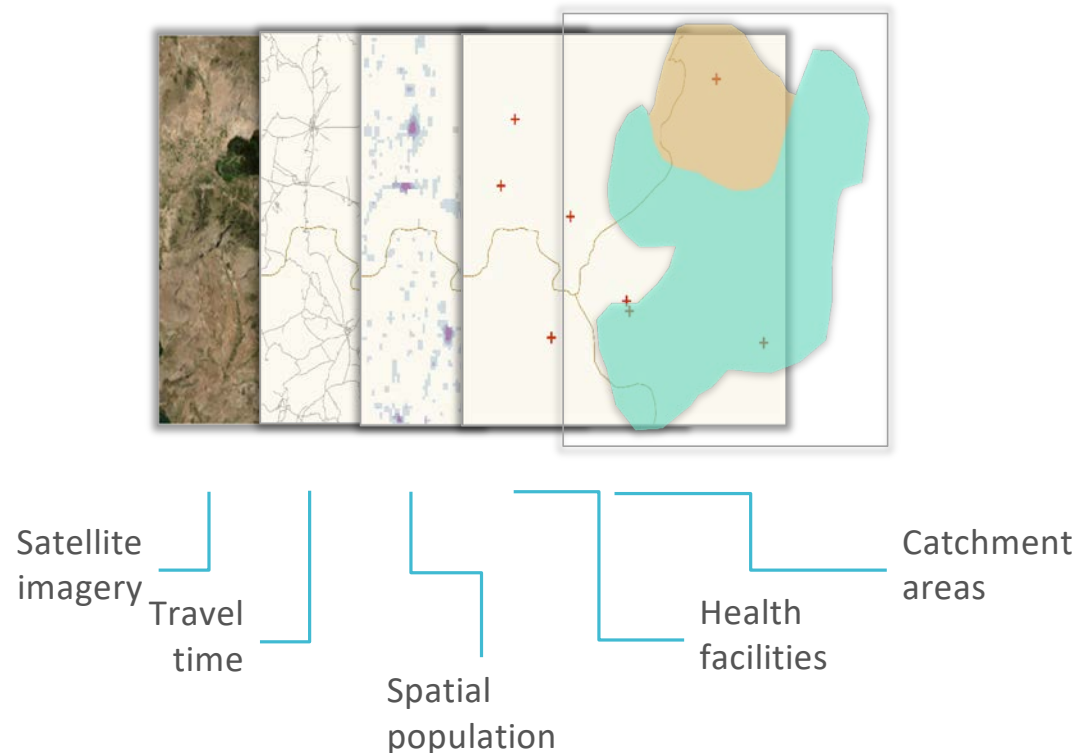
WHO GIS Centre for Health
Division of Data, Analytics and Delivery for Impact
www.who.int/data/gis @gissupport@who.int

- Supporting geospatial data and analytics
- Increasing the efficient use of GIS by the Member States and partners
- Promoting a GIS community of practice through training and technical expertise

Contact: gissupport@who.int

Applications of geospatial data and technology for

1. Mapping health facilities and immunization session sites
2. Catchment area delineation and basemap creation
3. Target population estimation and spatial distribution (including small-area estimation)
4. Geographic accessibility analysis and service optimization
5. Thematic mapping
6. Field and programme monitoring



Microplan basemap creation - Participatory mapping workshop



Microplan map creation

Digital microplans are created through a series of trainings and participatory workshops. Key components include:

- Mapping health facilities and immunization session sites
- Mapping catchment area delineation and basemap creation
- Online dashboards created for all health zones
- Gathering and collation of additional spatial and tabular data needed for the microplans (e.g. storage and supplies)



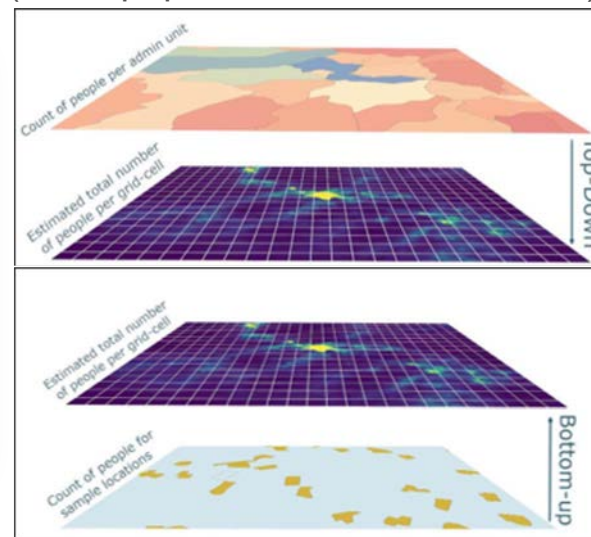
Improving target population estimates using geospatial data

High-resolution population estimates from secondary sources help improve the microplan target population estimates. Using spatial analysis and small-area estimation, official national data sources (e.g. census, survey, CRVS) can be triangulated and enhanced/projected to current year and targets.

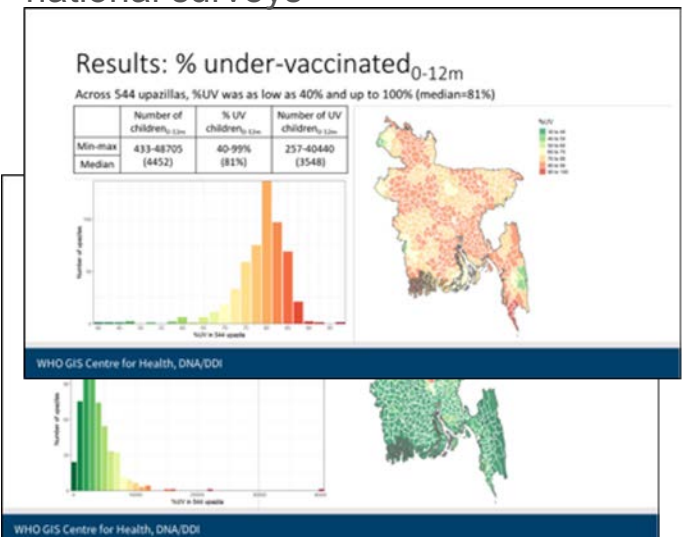
GIS data used for improving population estimates may include:

Household-level data:
Building footprints, survey data

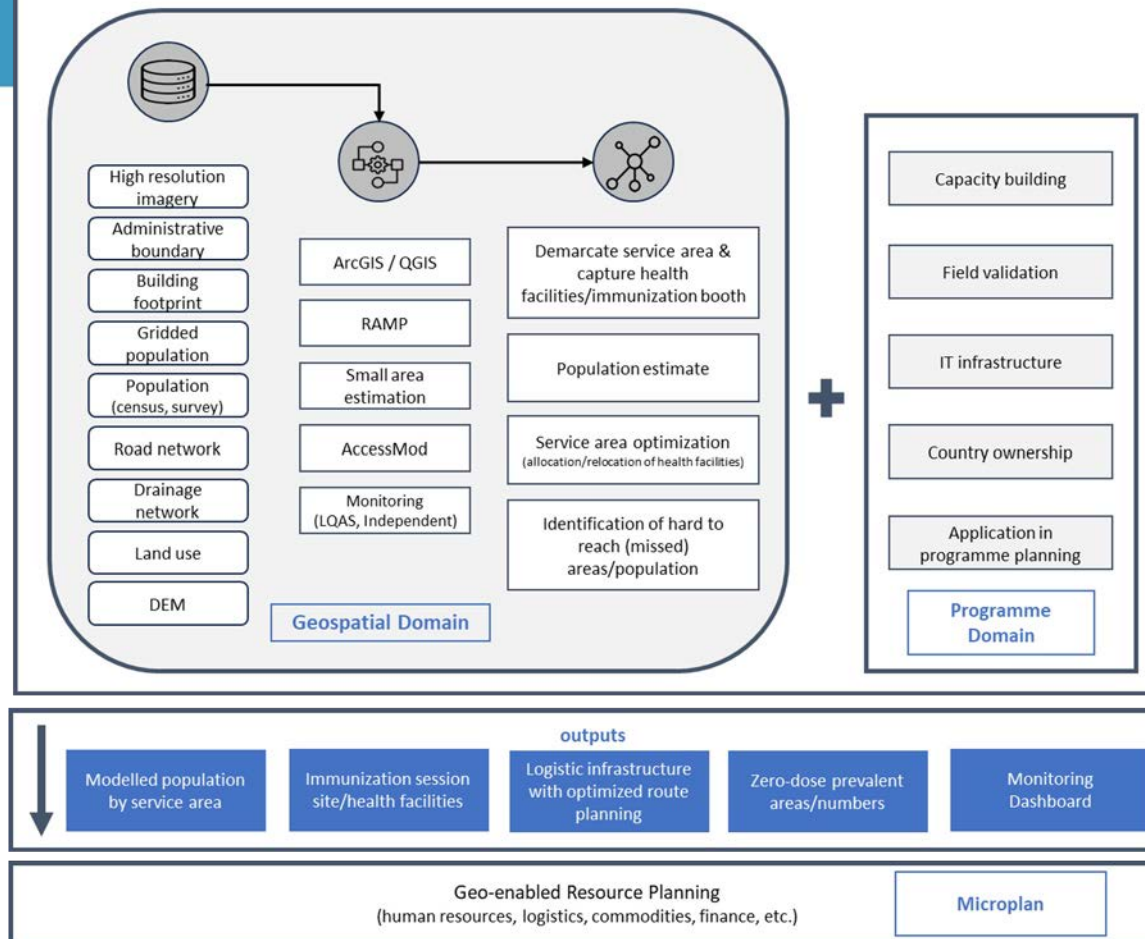
Modelled estimates:
(Worldpop, GRID3, Facebook, etc)



Small-area estimation: geo-statistical analysis to fill gaps in national surveys



Schematic diagram illustrating geo-enabled microplanning



Key benefits of geo-enablement

Enhanced Efficiency: GIS microplanning optimizes resource allocation and campaign logistics and value-for-money.

Improved Coverage: Near real-time data through the capturing of health facility catchments (sub-blocks) helps ensure all households are targeted, minimizing missed opportunities for reaching all populations.

Strengthened Monitoring: Geo-enabled dashboards provide leadership and decision-makers with near real-time progress tracking and immunization coverage estimates.

Sustainable Capacity and knowledge translation: Workshops with on-site GIS specialists strengthen capacities and ensure long-term sustainability and institutionalization.



GIS Microplanning Handbook and E-Learning Course



[Geo-enabled Microplanning Handbook \(link here\)](#)

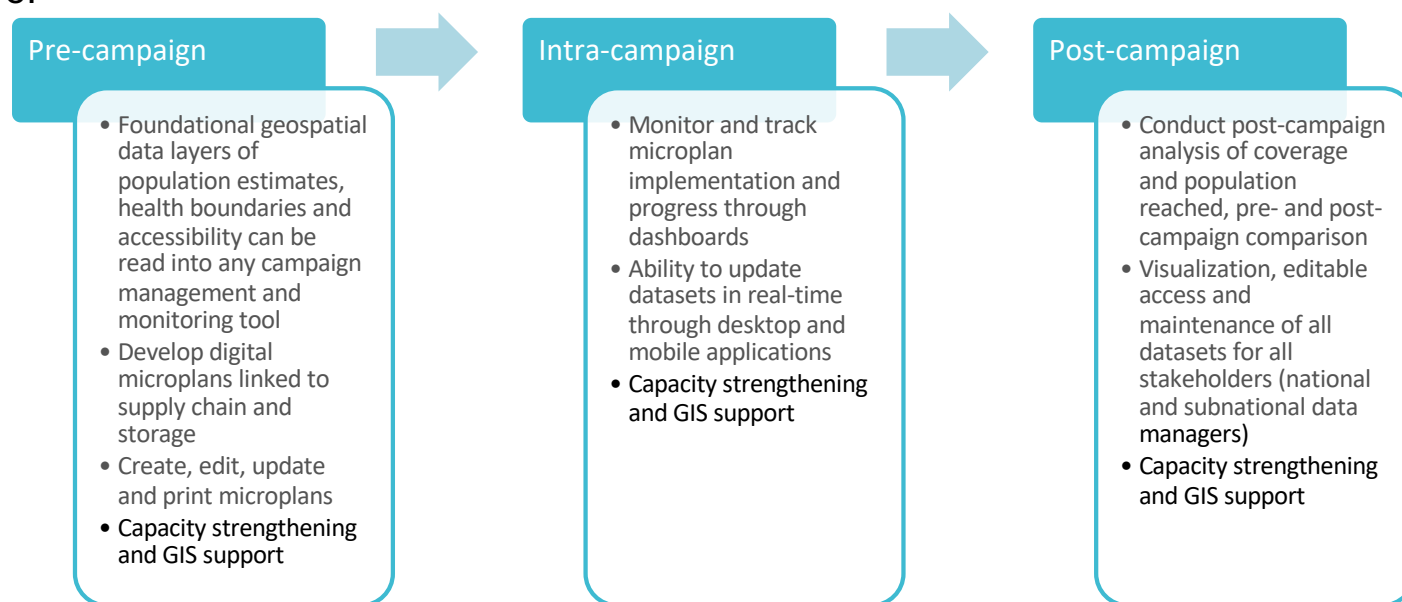
Planned translation in French

A screenshot of the WHO GIS Microplanning E-Learning Course interface. The interface is divided into a left sidebar with a menu and a main content area. The menu includes items like 'TAPOGRAPHIC ROUTE OPTIMIZATION MODELLING – AN OVERVIEW', 'BENEFITS OF ACCESSIBILITY MODELS IN MICROPLANNING', 'USE OF GEOGRAPHIC ACCESSIBILITY, SERVICE LOCATION AND ROUTE OPTIMIZATION MODELLING', 'PRODUCT OF MODELLING APPROACHES – EXAMPLE', 'THEMATIC MAPS – AN OVERVIEW', 'THEMATIC MAPS – VISUALIZING DATA', 'BENEFITS OF USING THEMATIC MAPS IN MICROPLANNING', 'USE OF POPULATION ESTIMATION AND SPATIAL DISTRIBUTION', 'KNOWLEDGE CHECK QUESTIONS', and 'KNOWLEDGE CHECK – 1'. The main content area is titled 'Module - 3: Introduction to the Applications of Geospatial Data and Technologies' and 'BENEFITS OF ACCESSIBILITY MODELS IN MICROPLANNING'. It contains a paragraph about the use of hand-drawn maps and a list of four benefits: 'Assess service coverage', 'Identify the quickest travel routes and optimize resource distribution across areas or routes', 'Ensure health service access is more equitable and cost-effective by identifying where to add service delivery points', and 'Redirect resources or alter supply routes to better serve target populations'. A video thumbnail is also present on the right side of the main content area.

One Campaign Management (OCM)

an integrated approach to geo-enabling immunization programmes

The OCM approach equips health programmes with a flexible and custom workflow to plan, execute, and evaluate campaigns with precision, all while integrated with existing national health systems and infrastructure.

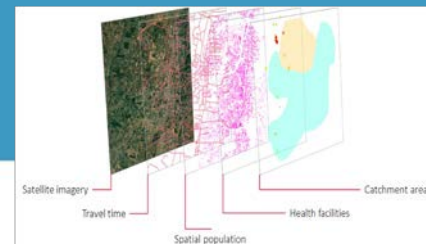


Scaling up Geo-enabled Microplanning (2024-25)

The **COVAX investments** enabled the development of the **Geo-Enabled Microplanning (GMP) Handbook**, setting a global standard and facilitating scale-up. Additionally, discussions are ongoing with **Cameroon, Chad, Niger, CAR, and Somalia** for implementation.



Components of Digital Microplan



Bangladesh

Proof of Concept

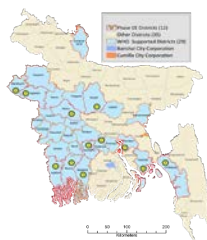
2 Districts, 5M pop,
3 months, 150K \$



A successful pilot tested cost-effective methods.

National Scaleup

27 Districts, 72M pop,
15 months, 1.7M \$

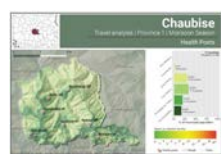


GMP is being scaled nationally in Bangladesh for the first time, proving its feasibility and effectiveness.

Nepal

National Rollout

77 Districts, 30M pop,
(5yr plan), 7 dist. (Y1, 200K \$)



Bangladesh Country Office's work influenced Nepal's strategy

Sudan

Early stages of discussion

3 regions – 1M pop



Early discussions with Sudan CO on implementing in **Red Sea, Kassala, and Atbara**

Afghanistan

Polio support

Province-East, South & Kandahar, 1M pop



With D2D restrictions, focus on mapping health facilities, temp sites, and population modeling.

Burundi

Bednet distribution

2 Provinces, 1M pop



Supported **Malaria bednet distribution** with satellite imagery and pilot workshops

Nigeria

Polio support

10 LGA – pilot and scale up



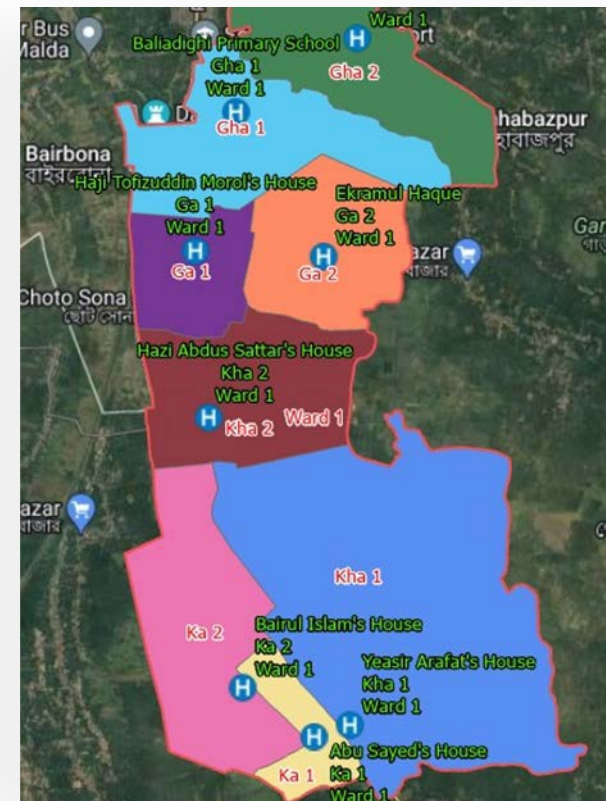
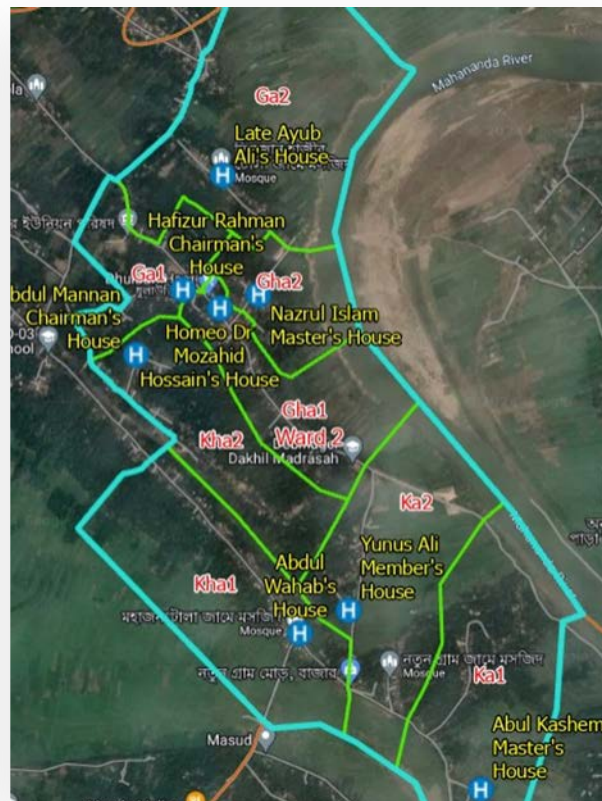
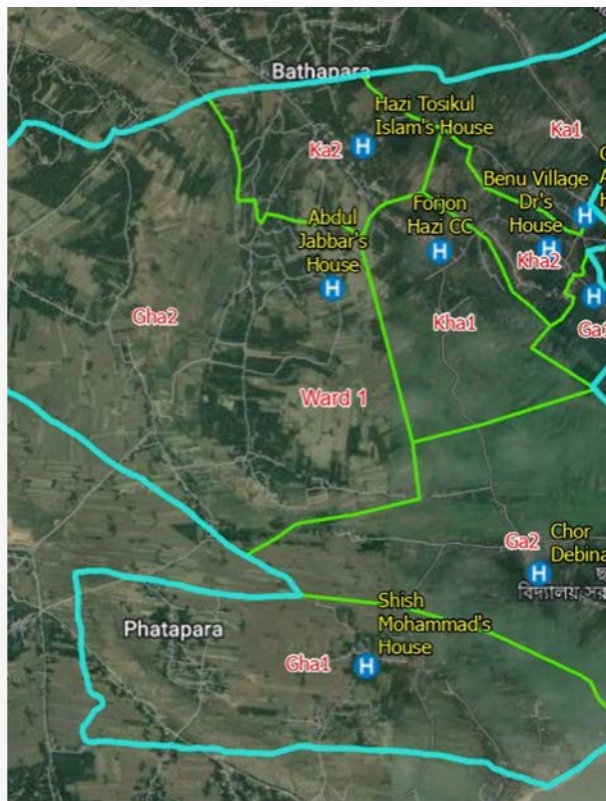
Initial talks with RO & CO on a full **digital microplanning package**

Bangladesh : Gaps Identified in Conventional Microplan

- Less active Immunization coverage and logistics monitoring practice.
- Errors in session sites distribution, selecting underserved areas, which leads to poor planning.
- Unavailable of real-time digital session planner for Monitoring and supervision.
- Difficult to identify Hard-to-reach and high-risk areas.
- Repetitive information in the Microplan ("copy-paste": prepared without any changes).

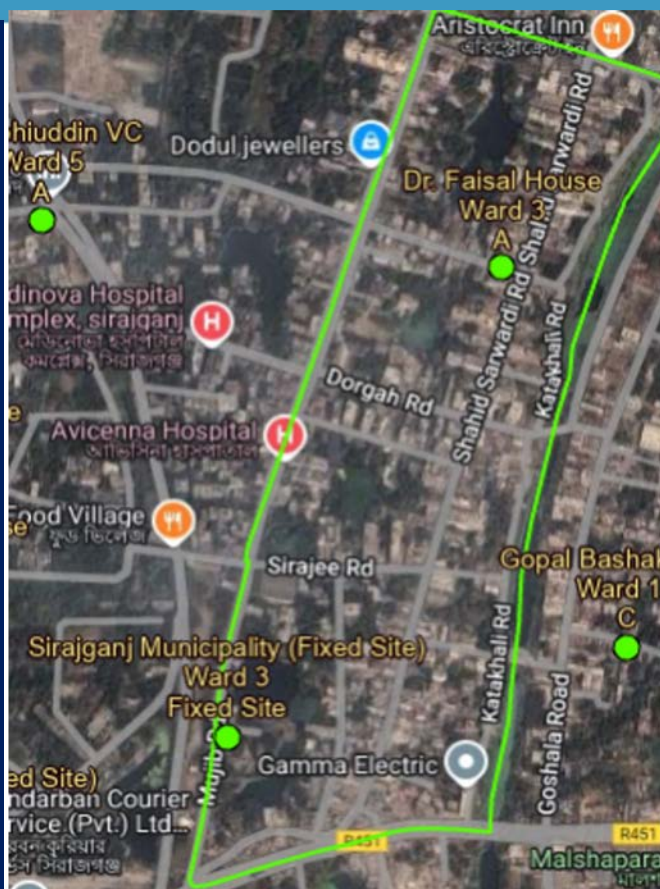


Maps – result of workshop

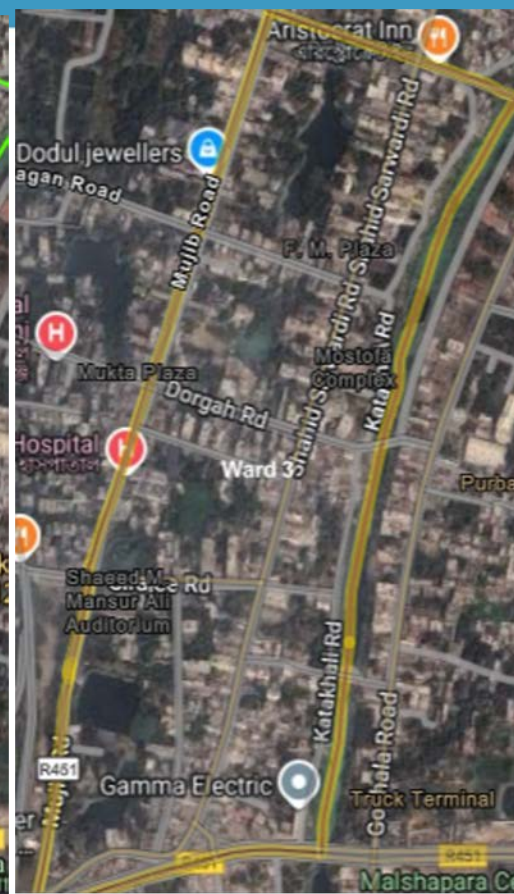


ORC added in Urban Immunization

2024



2023



**Rehabilitation
center and the new
settlement of the
homeless people of
that union in
another union
(due to river
erosion)**

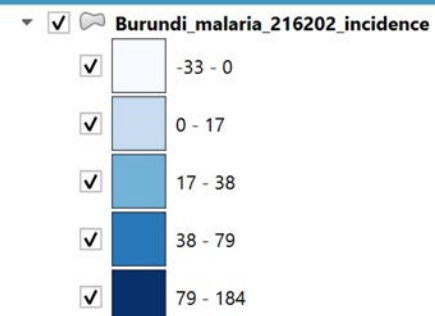
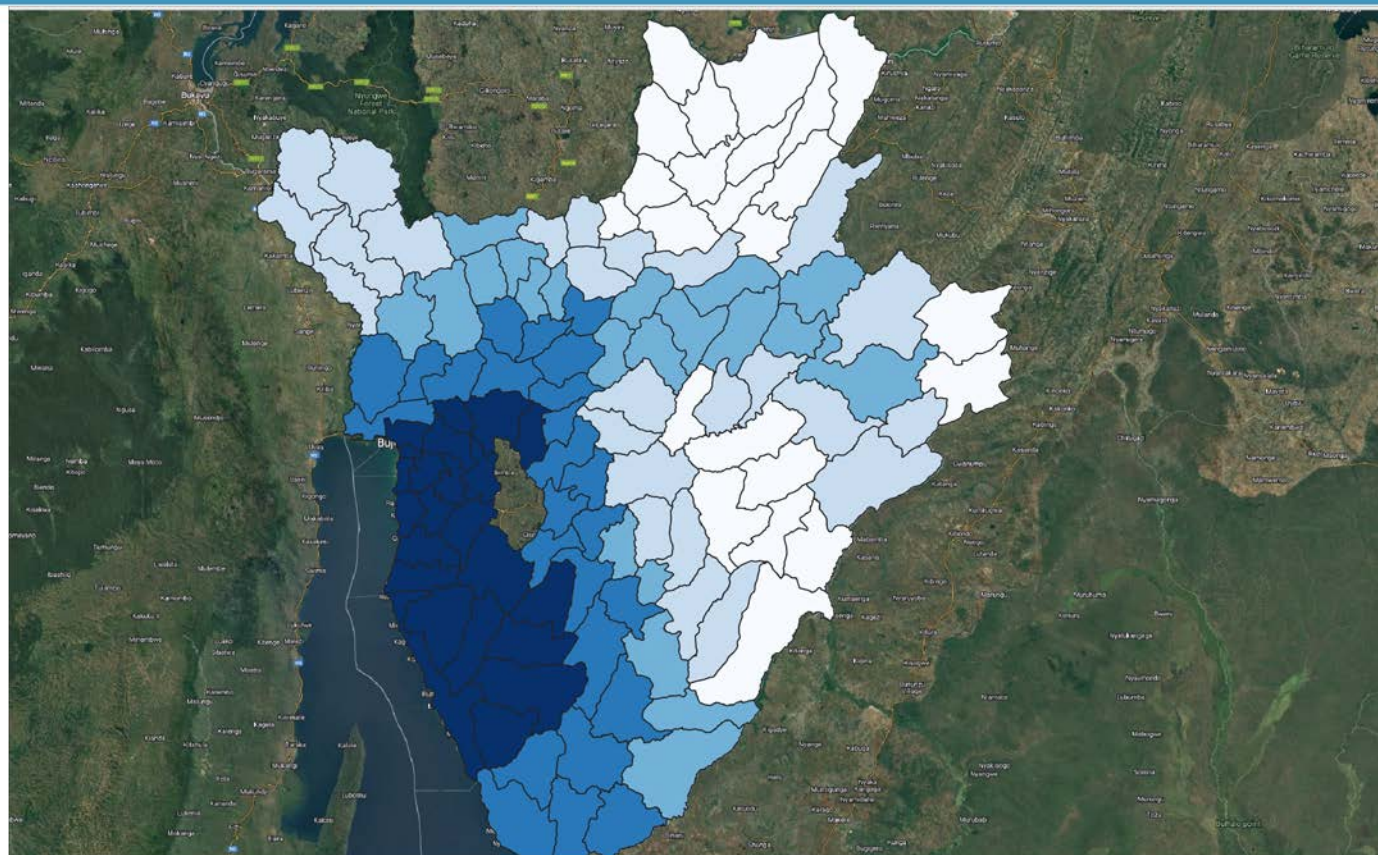


Practical Session on Data and Analysis for Malaria Prevention:

- Form Groups
- At least 01 Laptop per Group
- Collect satellite Map
- A problem will be given 01 or 02 groups will be asked to present

The Alliance for Malaria Prevention Annual Partners Meeting
Mövenpick Hotels & Residence
Nairobi, Kenya from 7 - 11 April 2025

Burundi – Monitoring Change in Malaria Incidence – 2016 & 2022



Malaria Atlas Project | Data

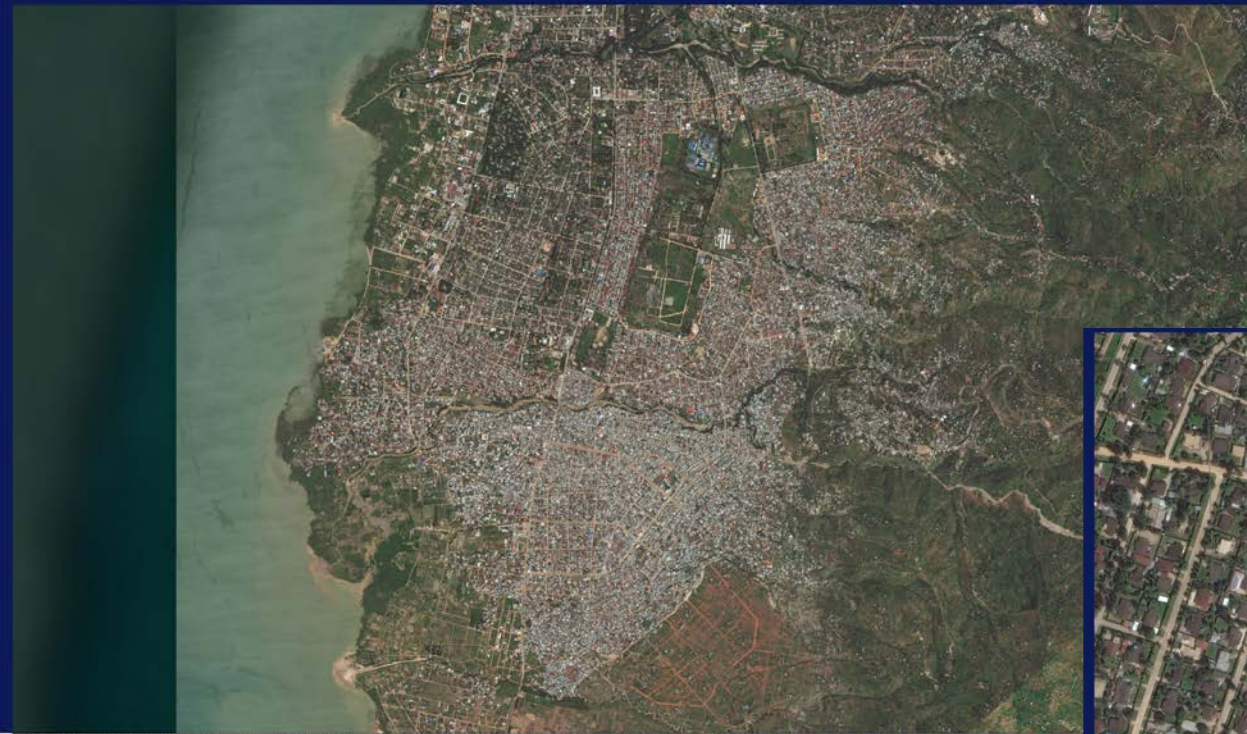
Main Objective

The main objective is to provide a brief introduction the process to demarcate catchment area on the paper map and digitalize using QGIS software as a part of digital micro-planning for the distribution of malaria prevention kits.

Specific Objectives

- Briefly present the five steps process of the microplanning
 - Interactive exercise to demarcate respective catchment area
 - Explore QGIS interface, some of its key menus and data format
 - Learn how to import, visualize, and overlay different layers, as well as extract a subset of vector and raster data.

Training on use of geospatial tools at 2025 Alliance for Malaria Prevention Annual Partners Meeting and Campaign Digitalization



The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on that part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data source: WHO 2024
Map production: WHO- GIS center for Health/ Department of Data Analytics
Map Date: 04 April 2025

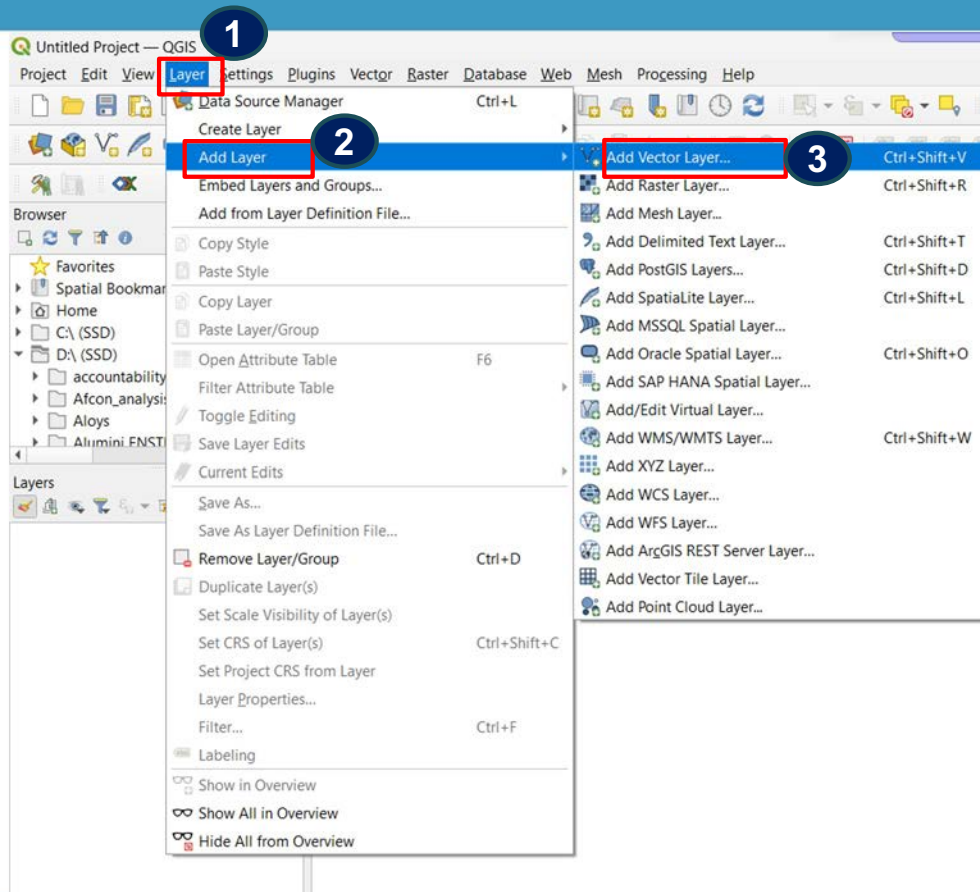
0 0.72

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on that part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data source: WHO 2024
Map production: WHO- GIS center for Health/ Department of Data Analytics
Map Date: 04 April 2025

0 0.36 0.36
World Health Organization
©WHO 2024. All rights reserved.

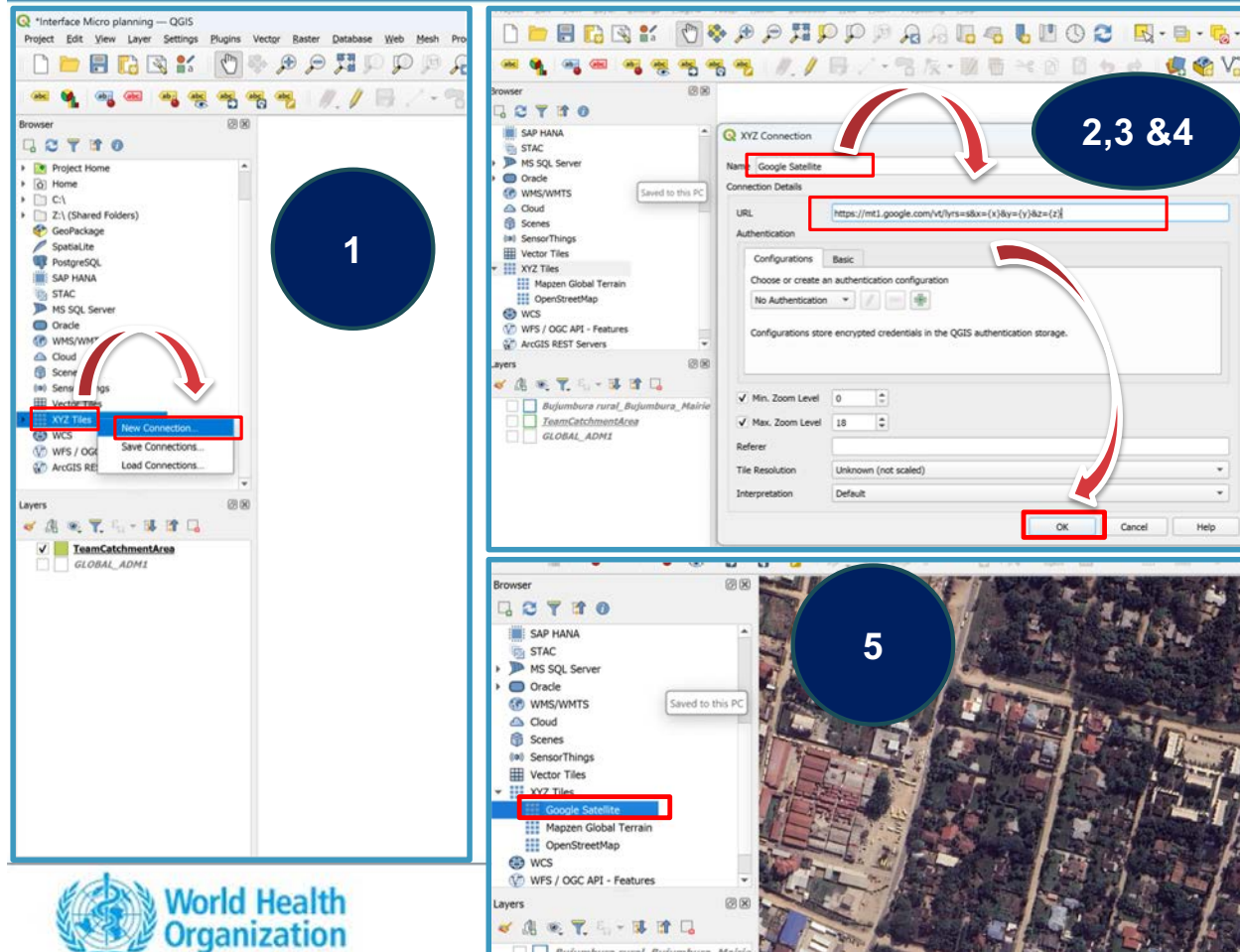
Importing shape (.shp) file into QGIS (1/3)



Step-by-Step Instructions to add vector layers:

1. Open your QGIS software
2. Go to the **Layer** menu and select **Add Layer**
3. Choose **Add Vector Layer**
4. **Geopackage** –add all layers

Adding satellite basemap through XYZ Tiles in QGIS (2/4)

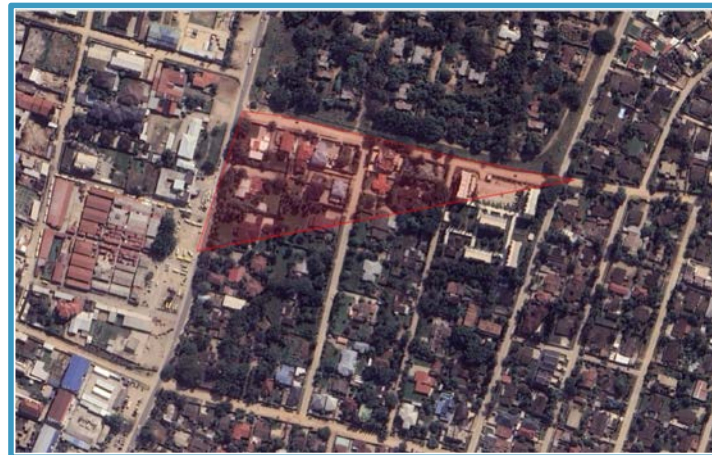
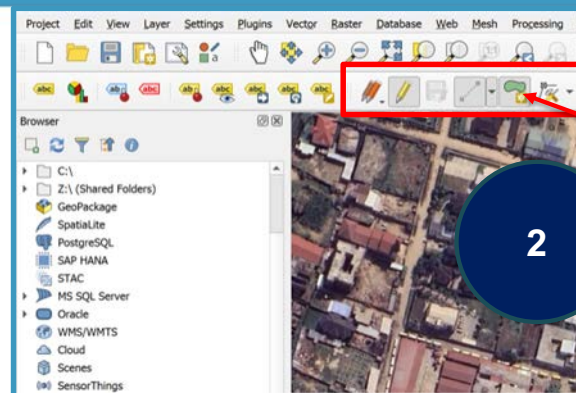
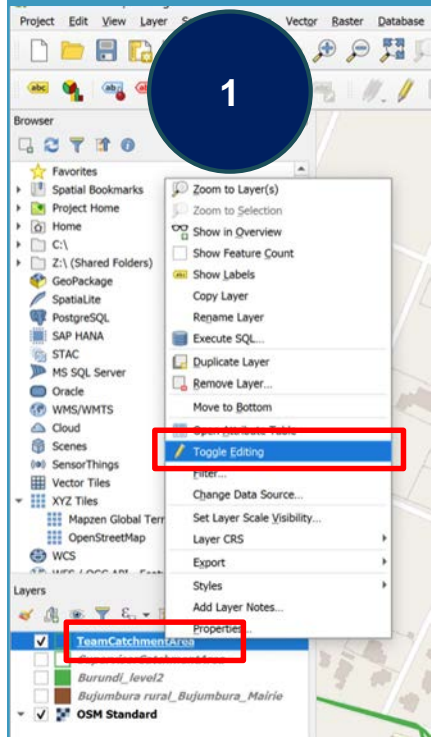


to Add a Satellite Basemap in QGIS:

1. In the Browser Panel (left side), right-click on XYZ Tiles and choose "New Connection..."
2. In the New XYZ Connection dialog:
 - Name: Google Satellite (or whatever you prefer)
3. Under URL, copy-paste inside the following link:
<https://mt1.google.com/vt/lyrs=s&x={x}&y={y}&z={z}>
4. Leave other settings as default, then click **OK**.
5. In browser panel, Expand XYZ Tiles and double click on **Google satellite** to display the satellite image

<https://mt1.google.com/vt/lyrs=s&x={x}&y={y}&z={z}>

Digitizing a catchment area into QGIS (2/4)



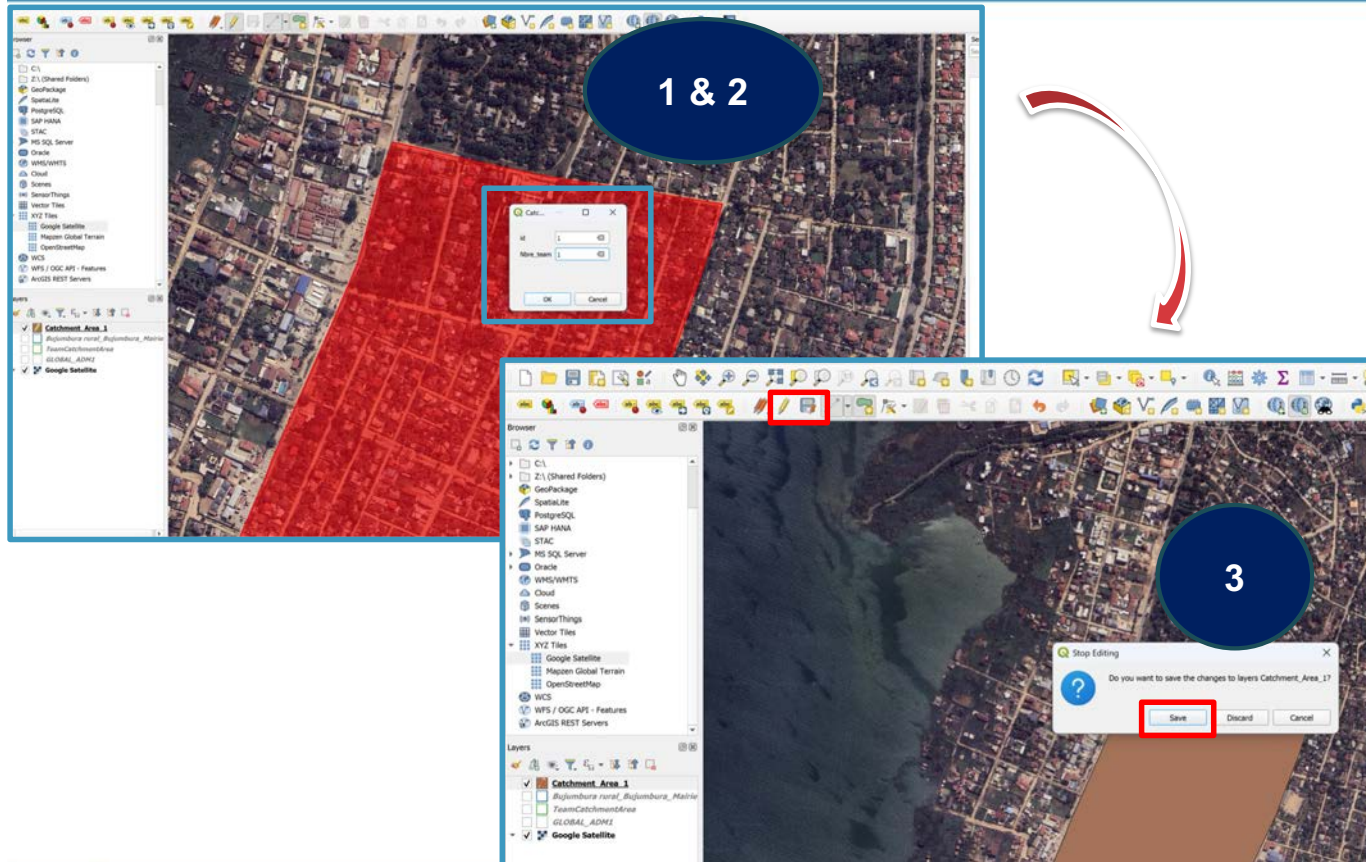
Start digitizing:

1. Right-click your new layer (Team catchment Area 1) > Toggle Editing

2. In the toolbar, click on the **polygon** and digitize the catchment on the image.

2 – Zoom on the image and digitize the catchment

Digitizing a catchment area in QGIS (2/4)



Finalize the digitalization process:

1. **Right-click** once at the end of the polygon to finish.
2. Fill in the attribute table info when prompted (Egs Id: 1 Team: 1)
3. **Save and Stop Editing:**
 1. Click the Save Edits icon  (disk with pencil).
 2. Click Toggle Editing again to stop editing.

Training on use of geospatial tools for microplanning of ITN distribution campaign

- Estimating the buildings need reached per catchment area**

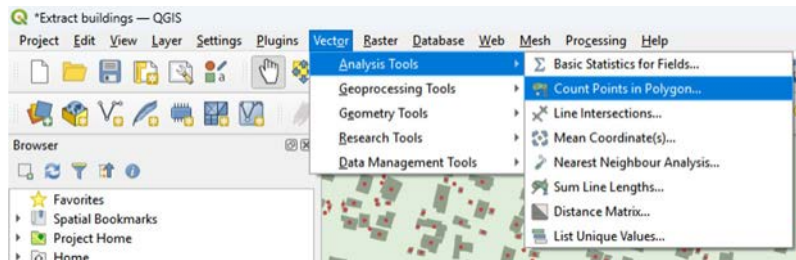
The Alliance for Malaria Prevention Annual Partners Meeting
Mövenpick Hotels & Residence
Nairobi, Kenya from 7 - 11 April 2025

Training on use of geospatial tools for microplanning of ITN distribution campaign

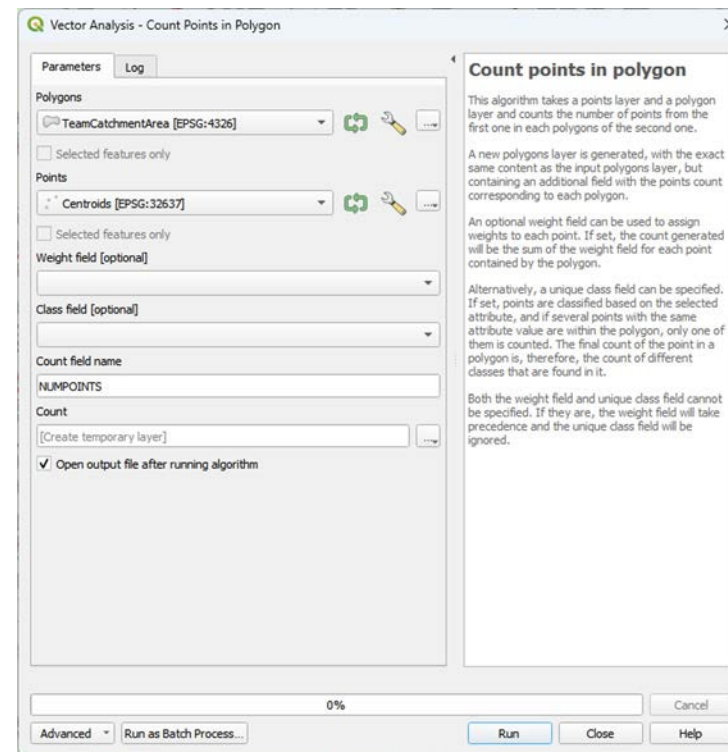
- Estimating the buildings need reached per catchment area

Obtain total counts of points in each team catchment area

1 Vector > Analysis Tools > Count Points in Polygon



2 Select the corresponding polygons and points layers



Training on use of geospatial tools for microplanning of ITN distribution campaign

- Estimating the buildings need reached per catchment area

Obtain total counts of points in each team catchment area

A new layer **Count** is generated, representing the catchment areas.

The number labels shown are the total counts of points/buildings in each catchment area.

Right Click > Open Attribute Table > Stroll to the Right

*Extract buildings — QGIS

Project: Count — Features Total: 32, Filtered: 32, Selected: 0

SUPERVISOR	SUPERVIS_1	SUPERVIS_2	TEAM_CODE	TEAM_NAME	TEAM_PHONE	COUNTRY	PROVINCE	DISTRICT	NOTES	Shape_Area	Shape_Len	GlobalID	CreationDa	Creator	EditDate	Editor	NUMPOINTS
1	AR-Kanyosha	MBARUBUKEYE...	79904184	SD-Bonne Hum...	NULL	Burundi	NULL	D5 Marie Sud	NULL	8.0638089923e-06	0.013141971667	(CAABE392-105...	16/03/2022	fred_irc	16/03/2022	fred_irc	574
2	AR-Kinindo	NAHMANA Su...	79945021	SD-Ecole Les M...	NULL	Burundi	NULL	D5 Marie Sud	NULL	8.472976244e-05	0.038710143103	(B8E2F710-E38D...	16/03/2022	fred_irc	16/03/2022	fred_irc	1307
3	AR-Kinindo	NAHMANA Su...	79945021	SD-Ecole Kinin...	NULL	Burundi	NULL	D5 Marie Sud	NULL	8.5573950081e-05	0.037266034289	(BE3E71AF-A9E...	16/03/2022	fred_irc	16/03/2022	fred_irc	1978
4	AR-Kinindo	NAHMANA Su...	79945021	SD-Eglise Osis...	NULL	Burundi	NULL	D5 Marie Sud	NULL	9.6996219744e-05	0.043540207693	(DC3DC657-0D...	16/03/2022	fred_irc	16/03/2022	fred_irc	950
5	AR-Kinindo	NAHMANA Su...	79945021	SD-Croix-Roug...	NULL	Burundi	NULL	D5 Marie Sud	NULL	7.5933096006e-05	0.041444344835	(205C8E79-FE12...	16/03/2022	fred_irc	25/03/2022	cbared_WHO	2317
6	AR-Kinindo	NAHMANA Su...	79945021	NULL	NULL	Burundi	NULL	D5 Marie Sud	NULL	6.9067964503e-05	0.041415510347	(ACF1EEF1-69A...	16/03/2022	fred_irc	16/03/2022	fred_irc	1350
7	AR-Kinindo	NAHMANA Su...	79945021	NULL	NULL	Burundi	NULL	D5 Marie Sud	NULL	5.1106987901e-05	0.038458718695	(940E8B8-408E...	16/03/2022	fred_irc	16/03/2022	fred_irc	1153
8	AR-Musaga	Biimana Deo	79578106	SD-Centre Aka...	NULL	Burundi	NULL	D5 Marie Sud	NULL	3.6330578102e-05	0.020570030314	(500DE21A-BE1...	17/03/2022	fred_irc	17/03/2022	fred_irc	754
9	AR-Musaga	Biimana Deo	79578106	SD-Ecole Kinan...	NULL	Burundi	NULL	D5 Marie Sud	NULL	7.3113415265e-05	0.038978622077	(F5AFAA3D-5B0...	17/03/2022	fred_irc	17/03/2022	fred_irc	1257
10	AR-Musaga	Biimana Deo	79578106	SD-Hope Clinic	NULL	Burundi	NULL	D5 Marie Sud	NULL	6.6551528886e-05	0.033219684799	(4F0ABE4D-FF0...	17/03/2022	fred_irc	17/03/2022	fred_irc	1150
11	AR-Musaga	Biimana Deo	79578106	SD-Ewa Vyisi	NULL	Burundi	NULL	D5 Marie Sud	NULL	3.8842724514e-05	0.029782947282	(1E6F5CDD-5E1...	17/03/2022	fred_irc	17/03/2022	fred_irc	1617
12	AR-Musaga	Biimana Deo	79578106	SD-Sequentier K...	NULL	Burundi	NULL	D5 Marie Sud	NULL	3.420779008e-05	0.027800203652	(07F9949-508E...	17/03/2022	fred_irc	17/03/2022	fred_irc	1649
13	AR-Musaga	Biimana Deo	79578106	SD-Centre Wallis	NULL	Burundi	NULL	D5 Marie Sud	NULL	4.0173017894e-05	0.033087510856	(AFC8E842-18B...	17/03/2022	fred_irc	17/03/2022	fred_irc	966
14	AR-Kanyosha	MBARUBUKEYE...	79904184	SD-CDS GYOYO	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	2.5650052332e-05	0.028626402338	(7227AA25-C04...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	1163
15	AR-Musaga	Biimana Deo	79578106	SD-Hozagana	NULL	Burundi	NULL	D5 Marie Sud	NULL	6.2810160518e-05	0.039156186813	(5844A73F-20E7...	17/03/2022	fred_irc	21/03/2022	fred_irc	1290
16	AR-Musaga	Biimana Deo	79578106	SD-CDS Musaga	NULL	Burundi	NULL	D5 Marie Sud	NULL	1.951175751e-05	0.026548470253	(4895DEDF-FB2...	17/03/2022	fred_irc	17/03/2022	fred_irc	1000
17	AR-Musaga	Biimana Deo	79578106	SD-Centre Arts...	NULL	Burundi	NULL	D5 Marie Sud	NULL	2.7858821751e-05	0.029123887673	(77D06710-012...	17/03/2022	fred_irc	17/03/2022	fred_irc	874
18	AR-Kanyosha	MBARUBUKEYE...	79904184	SD-CMS ROSSE	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	5.7406383809e-05	0.033450868432	(0C324050-A2B...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	1727
19	AR-Musaga	Biimana Deo	79578106	SD-CEM Musaga	NULL	Burundi	NULL	D5 Marie Sud	NULL	2.658120334e-05	0.028815252676	(D4A87821-74E...	17/03/2022	fred_irc	17/03/2022	fred_irc	932
20	AR-Kanyosha	MBARUBUKEYE...	79904184	SD-ECOFI KA...	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	9.8598870371e-05	0.043793116362	(157CAE8E-516...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	708
21	AR-Musaga	Biimana Deo	79578106	NULL	NULL	Burundi	NULL	D5 Marie Sud	NULL	3.4282482351e-05	0.024983713517	(10AB5CF7-125...	17/03/2022	fred_irc	17/03/2022	fred_irc	1105
22	AR-KANYOSHA	MBARUBUKEYE...	79904184	SD-CDS PARABEL	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	1.5314027233e-05	0.022894758644	(DCA85307-6F8...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	772
23	AR-Musaga	Biimana Deo	79578106	SD-Ecole Mus...	NULL	Burundi	NULL	D5 Marie Sud	NULL	1.9596217432e-05	0.01994919588	(D0512626-802...	17/03/2022	fred_irc	17/03/2022	fred_irc	1134
24	AR-Musaga	Biimana Deo	79578106	SD-IM Musaga	NULL	Burundi	NULL	D5 Marie Sud	NULL	1.6751006867e-05	0.024886731199	(9528867-0C6...	17/03/2022	fred_irc	17/03/2022	fred_irc	869
25	NULL	NULL	NULL	NULL	NULL	NULL	NULL	D5 Marie Sud	NULL	2.1913250592e-05	0.022549854802	(D5FA21D4-1CE...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	890
26	AR MUSAGA	BIZIMANA Deo	79578106	SD-ENR	NULL	Burundi	Maieie	D 5 Marie Sud	NULL	6.6832776513e-05	0.041088772454	(41A8FC23-45A...	17/03/2022	fred_irc	17/03/2022	fred_irc	1118
27	AR-KANYOSHA	MBARUBUKEYE...	79904184	SD-GOSHEN	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	2.996226196e-05	0.022325613235	(065DC4D0-8B...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	1616
28	AR-KANYOSHA	MBARUBUKEYE...	79904184	SD-FINE SCHOOL	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	2.1631763087e-05	0.019410438653	(9628D53F-58A...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	1032
29	AR-MUSAGA	BIZIMANA Deo	79578106	SD-Ecole les Ch...	NULL	Burundi	NULL	D5 Marie Sud	NULL	6.0360154899e-05	0.036802240901	(5EC8002E-A1E...	17/03/2022	fred_irc	17/03/2022	fred_irc	1018
30	AR-KANYOSHA	MBARUBUKEYE...	79904184	SD-CKA	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	1.5993881841e-05	0.020079189542	(7B4B7678-05A...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	717
31	AR-KANYOSHA	MBARUBUKEYE...	79904184	SD-CMPK	NULL	Burundi	NULL	D5 MAIRIE SUD	NULL	2.2214202074e-05	0.02063476772	(B8E09136-24A...	17/03/2022	nibakiremacy...	17/03/2022	nibakiremacy...	888

Show All Features

Type to locate [Ctrl+Q]

Toggles the editing state of the current layer

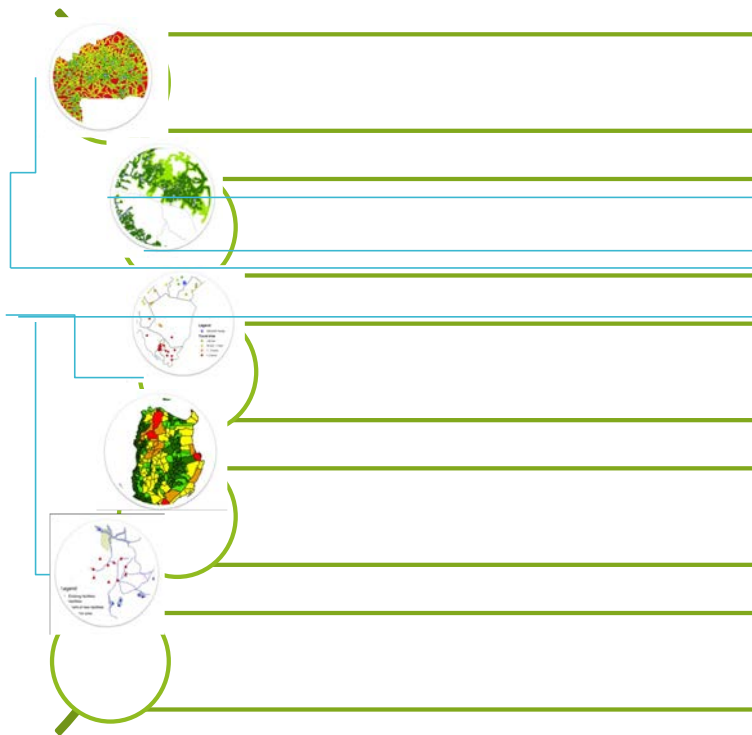
Coordinate: -578575, -382571 Scale: 1:24726 Magnifier: 100%

Training on use of geospatial tools for microplanning of ITN distribution campaign

Accessibility Analysis

The Alliance for Malaria Prevention Annual Partners Meeting
Mövenpick Hotels & Residence
Nairobi, Kenya from 7 - 11 April 2025

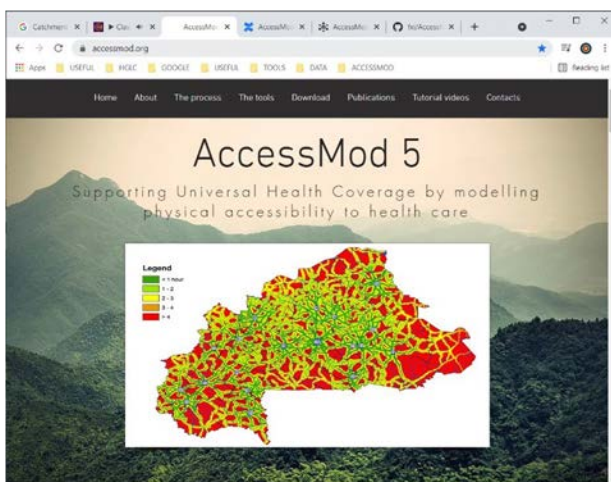
Accessibility analysis



1. Physical accessibility analysis: Assess how **physically accessible** existing health services are to the target population
1. Geographic coverage analysis: Part of the target population that would not receive care due to a **shortage of capacity**.
1. Referral analysis: Measure travel time and distances between **health facilities/ supplier**.
1. Zonal statistics: Identify percentage of the population having **physical access to health services within a given time**)
1. Scaling up analysis: Design and **simulate different scenarios** aiming at scaling up the existing service delivery network. (walking, motorized vehicles, etc.)

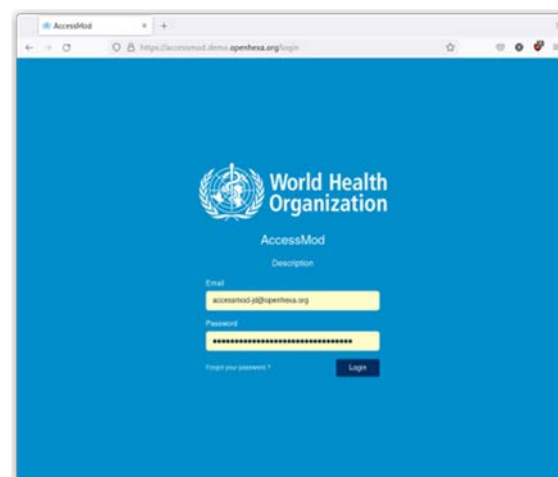
AccessMod

AccessMod 5.0, Standalone version
(2017 release)



<http://www.accessmod.org>

AccessMod Next-generation, Web Version
(2022 release)



<https://accessmod.openhexa.org/>

AccessMod - Input geospatial data



Health Facility location
HDX



Zones (admin division,
health areas): GISC



Transportation network
HDX



Barriers to movement
HDX



Target population distribution
WorldPop UNPD adjusted, 2024



Land cover
Source: Sentinel-2 10m 2024

class	label	speed	Mode
1	Water	0	walking
2	Trees	1	walking
4	Flooded vegetation	0.5	walking
5	Crops	1	walking
7	Built Area	4	walking
8	Bare ground	3	walking
9	Snow/ice	0.5	walking
10	Clouds	0	walking
11	Rangeland	1	walking
12	secondary	40	Motorized
13	trunk	70	Motorized
14	link	30	Motorized
15	unclassified	20	Motorized
16	tertiary	30	Motorized
17	track	25	Motorized
18	primary	60	Motorized
19	path	4	walking
20	service	20	Motorized
21	residential	20	Motorized

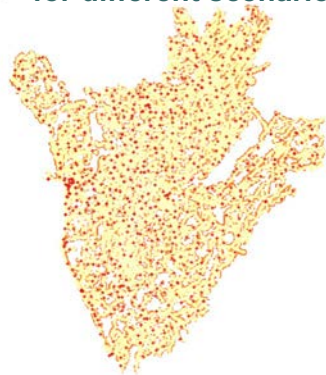
Travel Scenario



Digital elevation model
SRTM 30m

AccessMod – Outputs

Travel time distribution grid for different scenarios



Table

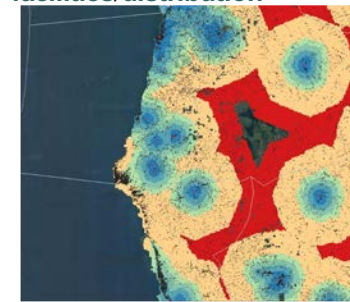
Zonal statistics

Population coverage by zones for the selected maximum travel time

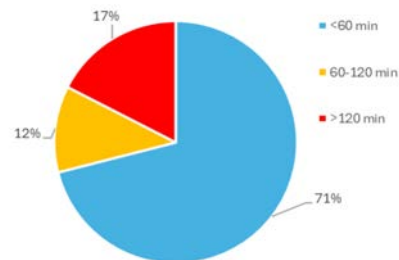
zone	area	pop_tot	pop_within	pop_within_area
1	...	...	...	...
2	...	...	...	...
3	...	...	...	...
4	...	...	...	...
5	...	...	...	...
6	...	...	...	...
7	...	...	...	...
8	...	...	...	...
9	...	...	...	...
10	...	...	...	...
11	...	...	...	...
12	...	...	...	...
13	...	...	...	...
14	...	...	...	...
15	...	...	...	...
16	...	...	...	...
17	...	...	...	...
18	...	...	...	...
19	...	...	...	...
20	...	...	...	...

download

Extent of travel time based catchment areas with location of added health facilities/distribution

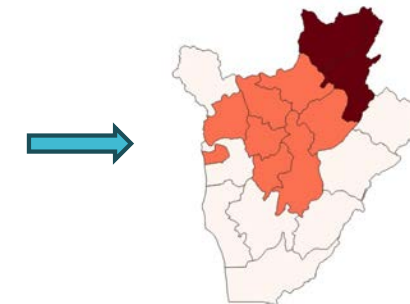


Accessibility (120 min) Walking+ motorized in main road



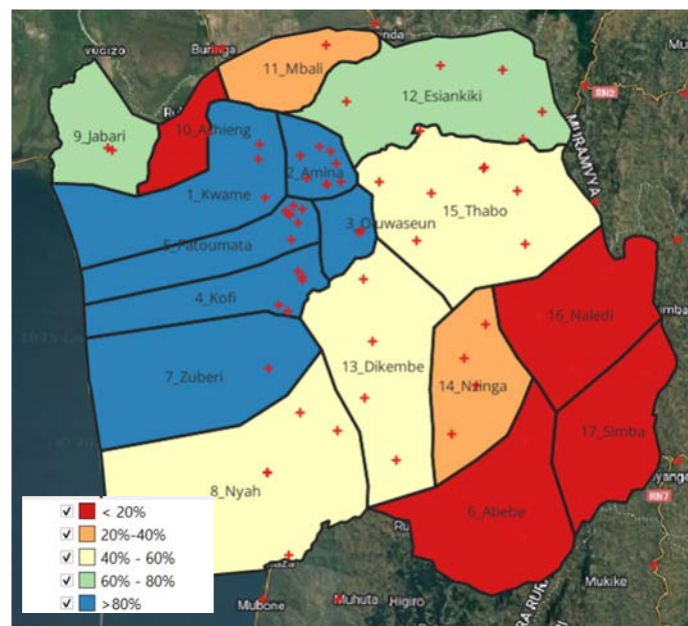
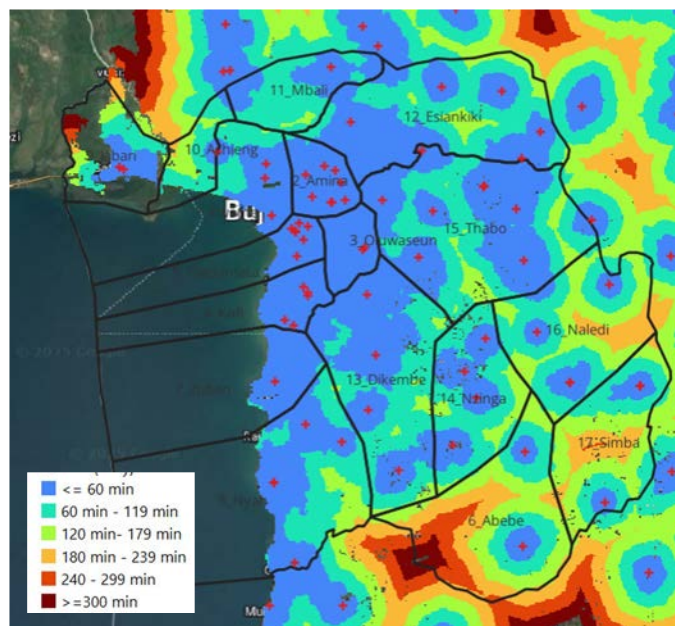
Proportion of population covered

id	WHO_REGION	ISO_3166_2	ADM_1	ADM_2	ADM_3	Pop_Tot	Pop_Within_120m	Pop_Within_120m_Area	Pop_Covered_120m	Pop_Covered_120m_Area
10	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.915
12	AFRO	BF	BURUNDI	BURUNDI	Mayinga	112412	88900	102227	0.790	0.907
2	AFRO	BF	BURUNDI	BURUNDI	Bujumbura	108007	92076	92045	0.857	0.860
10	AFRO	BF	BURUNDI	BURUNDI	Nagat	101248	20121	80483	0.207	0.878
5	AFRO	BF	BURUNDI	BURUNDI	Nyungu	65569	40130	58420	0.612	0.892
1	AFRO	BF	BURUNDI	BURUNDI	Bubanza	60538	48037	40448	0.794	0.675
7	AFRO	BF	BURUNDI	BURUNDI	Ukoga	140125	77525	88546	0.553	0.628
12	AFRO	BF	BURUNDI	BURUNDI	Ukoga	140125	77525	88546	0.553	0.628
14	AFRO	BF	BURUNDI	BURUNDI	Ukoga	140125	77525	88546	0.553	0.628
14	AFRO	BF	BURUNDI	BURUNDI	Ukoga	140125	77525	88546	0.553	0.628
14	AFRO	BF	BURUNDI	BURUNDI	Ukoga	140125	77525	88546	0.553	0.628
3	AFRO	BF	BURUNDI	BURUNDI	Bujumbura	108007	92076	92045	0.857	0.799
10	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.796
17	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.796
10	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.796
6	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.796
5	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.796
11	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.796
4	AFRO	BF	BURUNDI	BURUNDI	Burundi	108543	86404	90102	0.796	0.796



Population coverage by zones

Result



Catchment Incharge	PopTotal*	% pop needed more than 2 hrs travel time
1_Kwame	111,950	0%
10_Achieng	16,704	8%
11_Mbali	63,967	0%
12_Esiankiki	172,759	4%
13_Dikembe	147,269	5%
14_Nzinga	86,011	14%
15_Thabo	166,264	6%
16_Naledi	35,553	40%
17_Simba	26,314	53%
2_Amina	407,487	0%
3_Oluwaseun	87,231	0%
4_Kofi	250,391	0%
5_Fatoumata	181,648	0%
6_Abebe	32,262	69%
7_Zuberi	111,864	0%
8_Nyah	75,346	11%
9_Jabari	30,768	13%

Use of geospatial tools for microplanning of ITN distribution campaign

Resource estimation

The Alliance for Malaria Prevention Annual Partners Meeting
Mövenpick Hotels & Residence
Nairobi, Kenya from 7 - 11 April 2025

Catchment Incharge	Number of HF/distribution point	Number of building structure	PopTotal*	% pop needed more than 2 hrs travel time
1_Kwame	3	20752	111950	0%
10_Achieng	1	3702	16704	8%
11_Mbali	1	13427	63967	0%
12_Esiankiki	5	33161	172759	4%
13_Dikembe	4	30021	147269	5%
14_Nzinga	4	9635	86011	14%
15_Thabo	8	34438	166264	6%
16_Naledi	4	10059	35553	40%
17_Simba	3	9549	26314	53%
2_Amina	8	53991	407487	0%
3_Oluwaseun	2	19966	87231	0%
4_Kofi	5	39962	250391	0%
5_Fatoumata	7	23634	181648	0%
6_Abebe	2	8916	32262	69%
7_Zuberi	1	15266	111864	0%
8_Nyah	5	18148	75346	11%
9_Jabari	2	10370	30768	13%

The table gives estimate of population reach within 2 hours travel time and number of houses in the respective catchment areas. These are information derived from model, is one of the techniques to derive denominators for programme planning. Participants are required to estimate resources based on the tables.

- What should be **best strategy** to reach maximum number of population in LLIN distribution campaign?
- Estimate **LLIN(Bale)** for area
- Calculate **storage requirements**
- Decide whether any **catchment area need additional distribution sites** or focused communication in making inaccessible areas or intensify monitoring visits.
- Explain how **geo-enablement compliments conventional micro-planning.**