Geo-enabled Microplanning for Immunization in Bangladesh

Geographic Information Systems (GIS) Centre for Health

Department of Data and Analytics, DDI

NAME

TITLE, GIS Centre for Health

World Health Organization

WHO GIS Centre for Health

Division of Data, Analytics and Delivery for Impact

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Outline

- What is geo-enabled microplanning?
- Microplanning for Immunization in Bangladesh:
  - Overview
  - Stakeholders and timeline
  - Tools and methodology
  - Best practices and achievements
  - Challenges and opportunities
  - Lessons learned and recommendations
  - Future work
- Q&A

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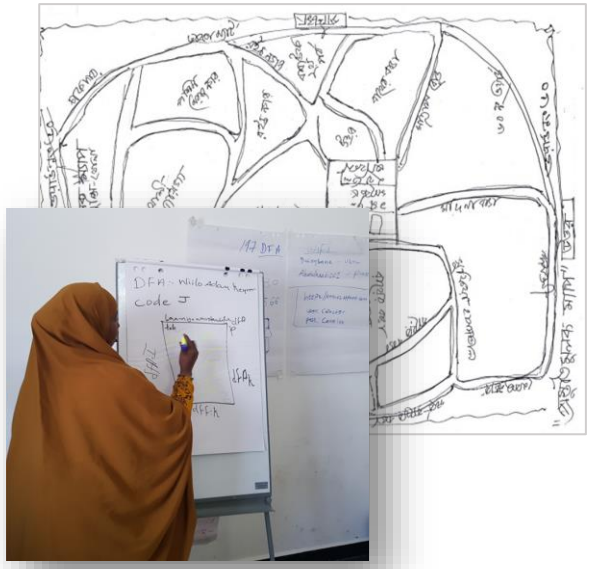
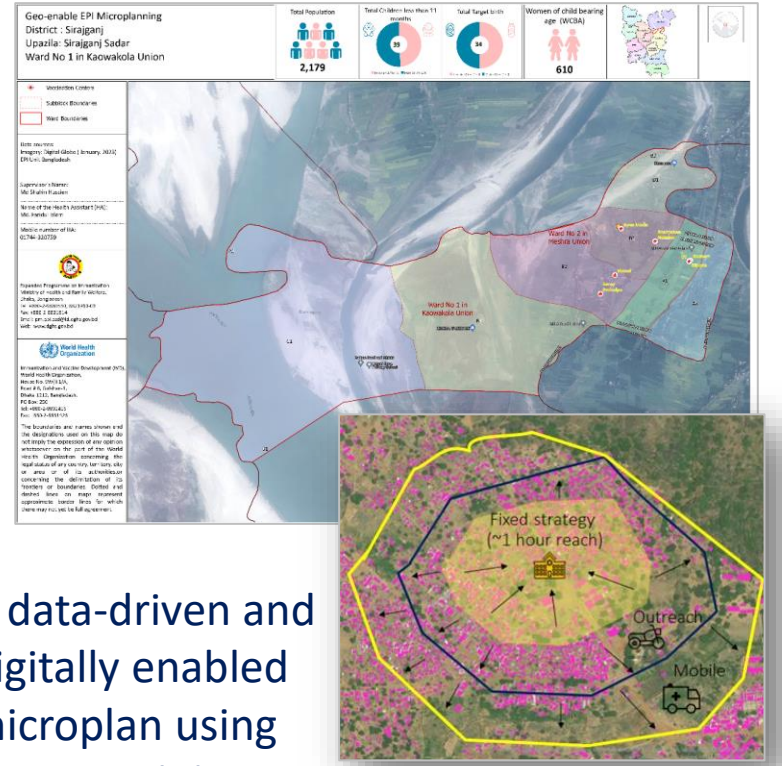
What is a geo-enabled microplan?

In comparison to traditional microplans which use tables and hand-drawn maps, “Geo-enablement” involves the application of geospatial data and technologies to the process.



Microplanning using hand-drawn maps and non-digital tools

Converting hand-drawn maps into GIS using community knowledge



A data-driven and digitally enabled microplan using geospatial data and technologies

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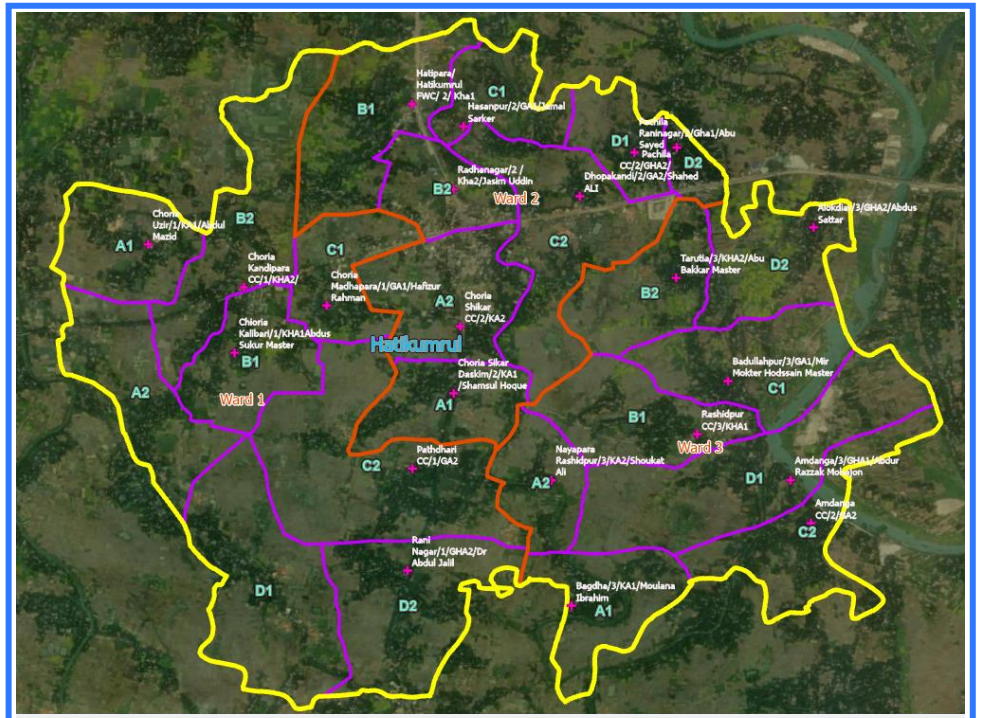
Uses of geo-enabled microplans

Geo-enabled microplans are used to:

- address gaps in service delivery to reach all members of a community, including under-served and missed populations.
- they improve the timeliness and efficiency of a campaign, leading to higher coverage and protection against preventable diseases.
- Reduce waste and duplication

Geo-enabled microplans are:

- A map representation of a programme microplan, comprising:
  1. the cartographic component- the map
  2. the demographic component – the spreadsheet
- An essential tool for identifying and locating where targeted population are on space for programme implementation and for accountability



Country	Division	District	Upazila	Union	Ward_Name	Sub_block
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 1	A1
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 2	A1
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 3	A1
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 2	A2
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 3	A2
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 1	A2
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 2	B1
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 1	B1
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 3	B1
Bangladesh	Rajshahi	Sirajganj	Ulla Para	Hatikumrul	Ward 1	B2

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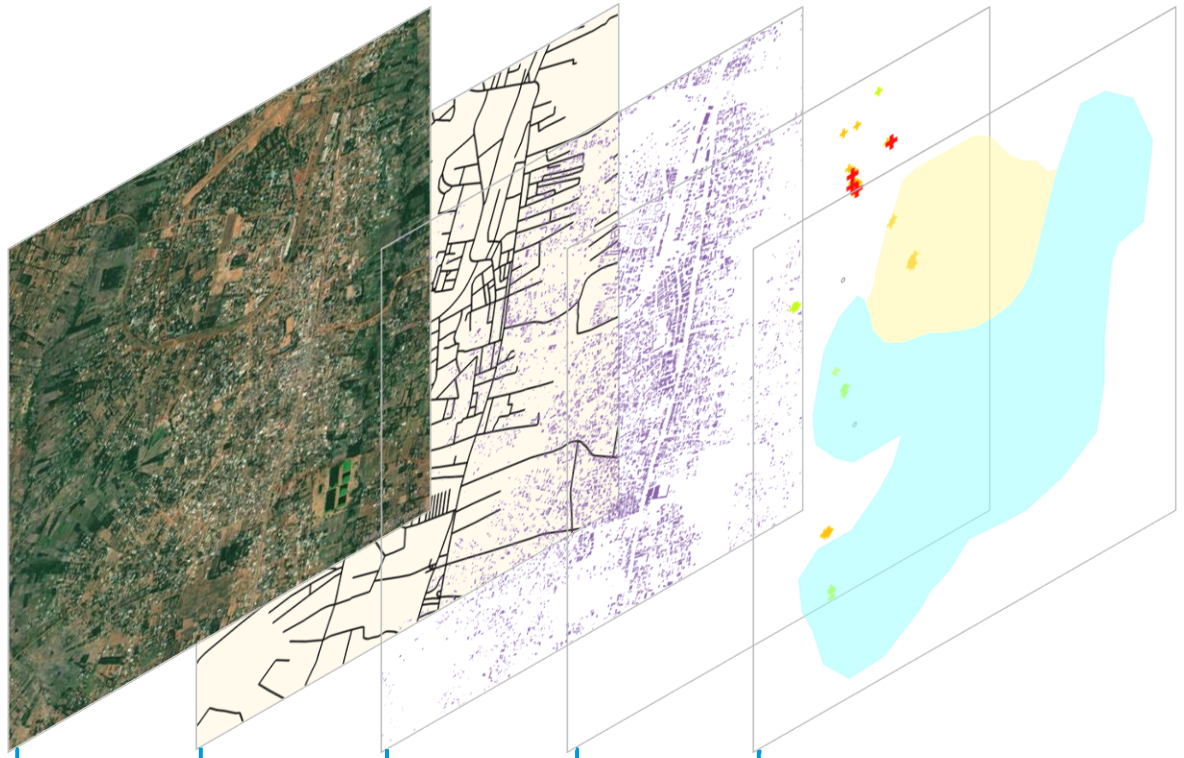
Geospatial data inputs for microplans



Satellite imagery

Travel time

Spatial population

Health facilities

Catchment areas

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Meet the WHO GIS Centre for Health team

Ali
Monitoring and Evaluation

Anare
GIS Specialist

Annette
GIS specialist

Asela
GIS specialist and data expert

Bodour
Project facilitator

Brian

Cam
GIS Specialist

Carlos
Geospatial Health Analyst

Catherine
Project facilitator

Chris
Emergency specialist, project facilitator

Cici
Geospatial data scientist

Daniel
GIS server expert

Denise
Monitoring and evaluation

Francis
GIS Specialist

Gédéon
GIS specialist

Gopi
GIS Specialist

Ian
GIS specialist

Jaouad
GIS specialist, project facilitator

Jing
Product evangelist

Jon
Partnerships

Julia
Geospatial data assistant

Kshitij
Web and IT specialist

Kt
Cartographer

Kerry Wong

Luzviminda
Administrative support

Marissa
Administrative support

Mona
Project facilitator

Nadika
Geospatial Health Analyst

Nomsa
Business analyst

Oluwaseun
GIS specialist

Paul
GIS Specialist

Ravi Shankar
GIS team lead

Ryan
GIS specialist

Samuel A
GIS specialist, project facilitator

Samuel O
GIS Specialist, Project facilitator

Tamer
GIS specialist, project facilitator

Yamiko
GIS specialist

What does the GISC do?

With an implementation **methodology** that combines advocacy, capacity development, service and support, the Centre provides technical assistance and fosters geospatial capacities for Health at all WHO levels through the Country and Regional Offices with Ministries of Health.

Advocacy

- Bilateral meetings
- Key UN meetings
- Mission
- Conferences
- Events
- Presence

Service

- Technical Assistance
- Maps
- Projects
- Request
- Conceptualization
- Definition
- Planning
- Execution

Capacity Development & Support

- Workshops
- Training – online, face-to-face
- Webinars
- Events
- Office hours
- Mentoring
- Missions

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Geo-enabled Microplanning for Immunization in Bangladesh

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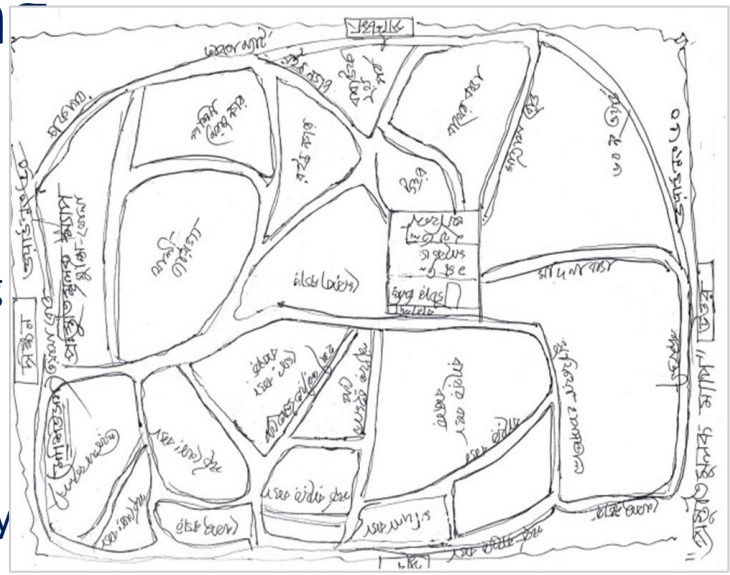
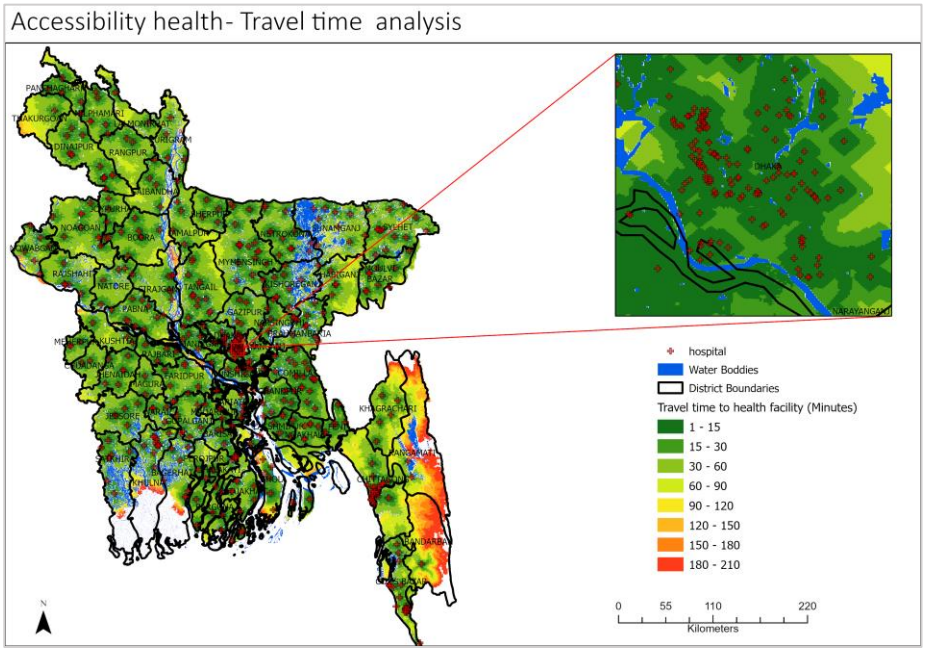
Bangladesh GIS Mapping & Microplanning Activities

Objectives:

1. To build capacity on foundational GIS mapping and digital microplanning
2. To implement and generate GIS microplan granular data and tools in piloted two districts (19 Upazilas and 2 City corporations) for GIS based mapping and microplanning
3. To scale up GIS-based mapping and microplanning in all Districts and City Corporation in support of the country EPI programme implementation



Hand drawn sketch by Health Assistant



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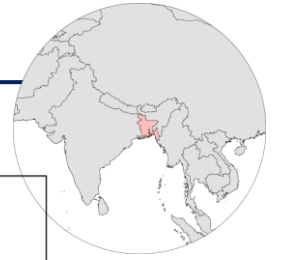
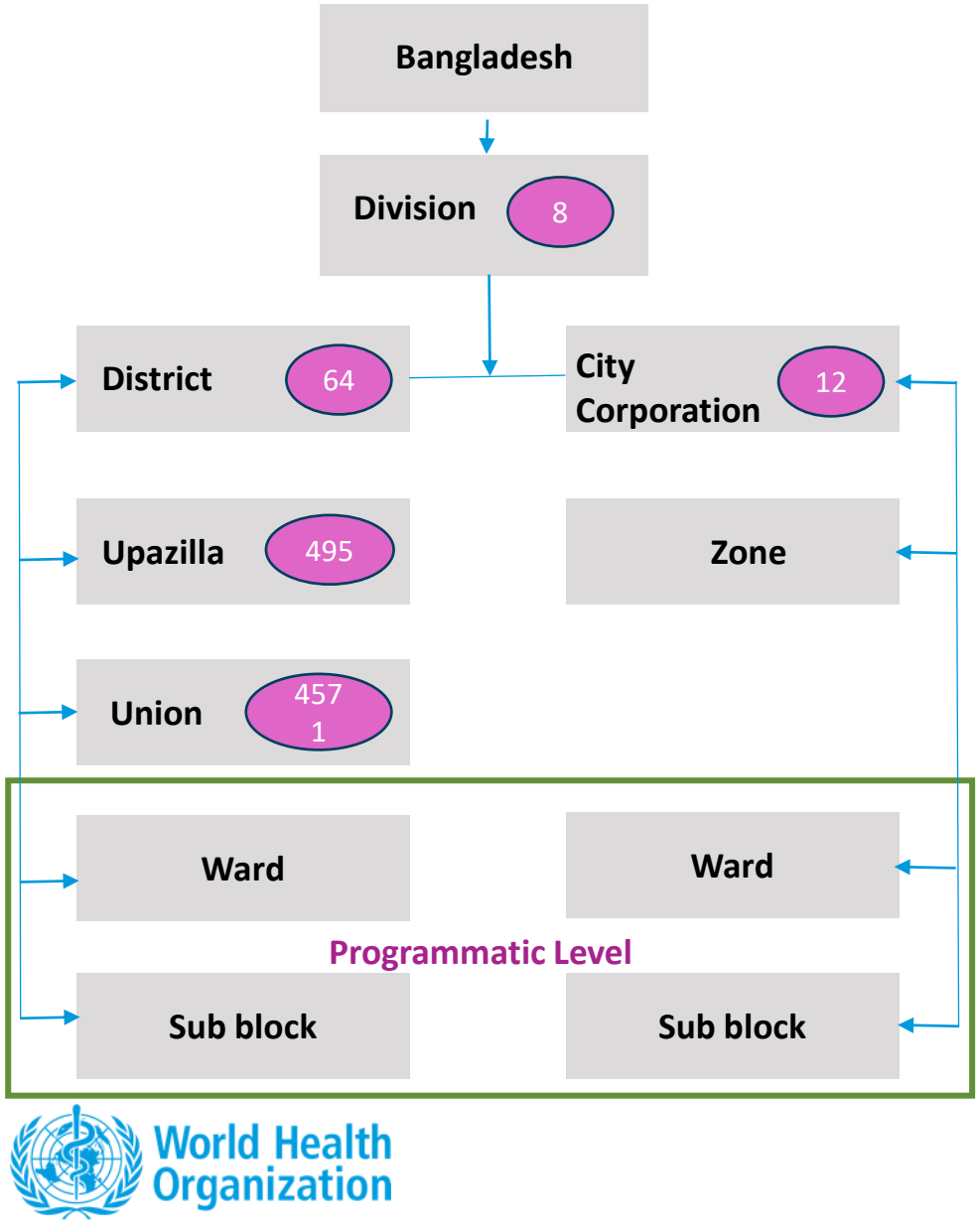
Bangladesh Admin Hierarchy / EPI Programme





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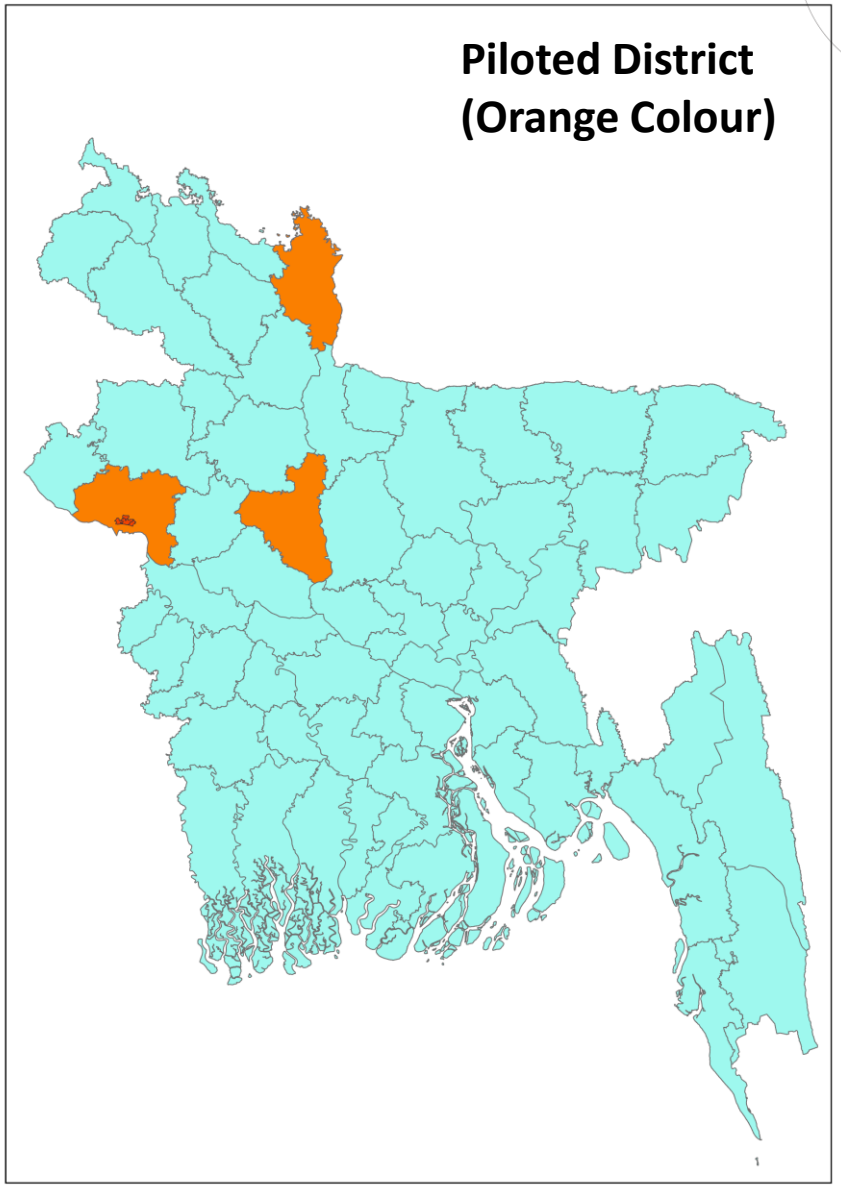

GIS Microplan Workshop Stakeholders Participants

Breakdown of participants of the GIS Microplan Workshop in Rajshahi City Corporation and Sirajganj District

S/N	Stakeholder	Rajshahi CC, Sirajganj & Kurigram	Total
1	GIS Experts (GIS Centre HQ)	3	3
2	SIMOs, Data Managers and other WCO staff trained (WHO, Bangladesh)	64	64
3	Health Assistant (Ministry of Local Government)	630	630
4	Supervisors and other Senior MoH (MoH, EPI)	15	15
			712

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Geo-enabled Microplanning Support for Bangladesh

July 2022 to October 2023

July 2022

Meeting conducted on GIS System Implementation at EPI-DGHS

October 2022 – April 2023

GIS tool and server development

March – June 2023

Onboard of International Consultant from GISC for ArcGIS system implementation

10-15 June 2023

Microplanning implementation: Training on GIS mapping and microplanning

17-20 June 2023

Field piloting of GIS based mapping microplanning at Sirajganj district

21-22 June 2023

National Orientation on ArcGIS Application and sharing field exercise

25-26 June 2023

Field piloting of GIS based mapping and Microplanning at Mymensingh CC

28 August 2023

Onboard of two international consultants from GISC to support rollout of microplanning implementation

September 2023

District-level Microplanning trainings and workshops ongoing; 19 upazilas (2 districts) trained so far.

22 October 2023

National Dissemination of GIS Based Mapping and Microplanning

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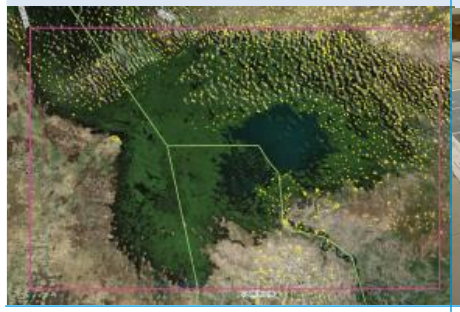
Geo-enabling Microplanning Workshop Exercise

1 Scope & Planning

Define the area of extent and the type of campaign



DEFINE THE SCOPE

- Determine the area to be covered (AOI)
- Identify the type of campaign
- Evaluate capacity of the country/district to carry out the exercise.
- Calculate the budget for the project
- Plan for phasing of the project

VACCINATION CAMPAIGN TYPE

- Door to door
- Fixed post
- Transit plan or cross border vaccination
- Hit and run strategy

PERSONNEL & RESOURCES

- Country team lead, stakeholders
- Programme team (immunization, malaria, consultants, etc.)
- HQ - RO country support team
- Core Mapping team

Based on the AOI and the capacity of the country, run the project in phases

2 Basemap

Collect & prepare basemap using satellite & contextual information

SATELLITE IMAGERY & ALLIED DATA

- Determine the availability of high-resolution satellite imagery
- Supplement with OpenStreetMap or Google Streetmap for thematic maps

BASEMAP PREPARATION

- Producing map atlas and map book
- Printing the maps
- For fixed post campaigns, add the information on location of facilities and their categories
- For the cross-border strategy, add the information on the cross-border movement

PERSONNEL & RESOURCES

- Core Mapping team
- Project focal point
- Satellite imagery, plotters & stationary

Refine the AOI depending on the availability of imagery

3 Workshop

Run a workshop with the field supervisors identifying their existing areas

MICROPLANNING WORKSHOP

- Invite the field vaccination teams and health officials for the workshop.
- Encourage them to bring their existing microplans
- Train the data managers on the digitization process
- If the number of teams is large, stagger the team presence in the workshop

DIGITIZATION

- Densify the base map with information given by the campaign teams' hand drawn microplans.
- During the workshop, employ a continuous quality check process to verify the digitized results.
- Revisit results and calibrate based on the quality check, then continue the digitization process.

PERSONNEL & RESOURCES

- Data managers, Core Mapping team
- Campaign team, field workers or team leads & health officials
- HQ - RO country support team

Extend the workshop until the outcomes of the digitization results are satisfactory

4 Field validation

Field validation on the digitized microplan boundaries for quality check and control

FIELD VISIT

- Pick random areas in the field to do the field validation
- Plan the logistics of the travel in advance
- Complete this check until results match the level of expectations specified at the beginning.
- Think of an accurately mapped area as a process that can be replicated and scaled to other areas.

POSSIBLE OUTCOMES

- Redistribution of the teams' areas
- Finding unvisited areas
- Identify overlapping areas between teams
- Cross validating the population count
- Accountability and transparency

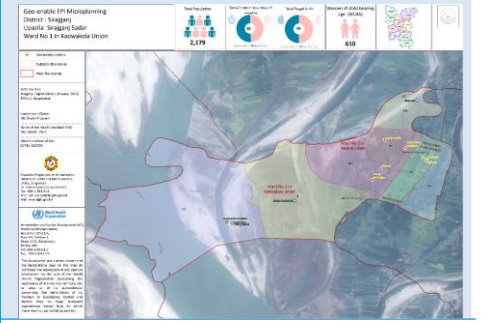
PERSONNEL & RESOURCES

- Core Mapping team
- Campaign team, field workers or team leads, health officials, and drivers
- HQ – RO country support team

Improve the microplan boundaries based on the field inputs

5 Mainstream

Using digitized microplan boundaries for operational planning, post campaign monitoring & resource allocation



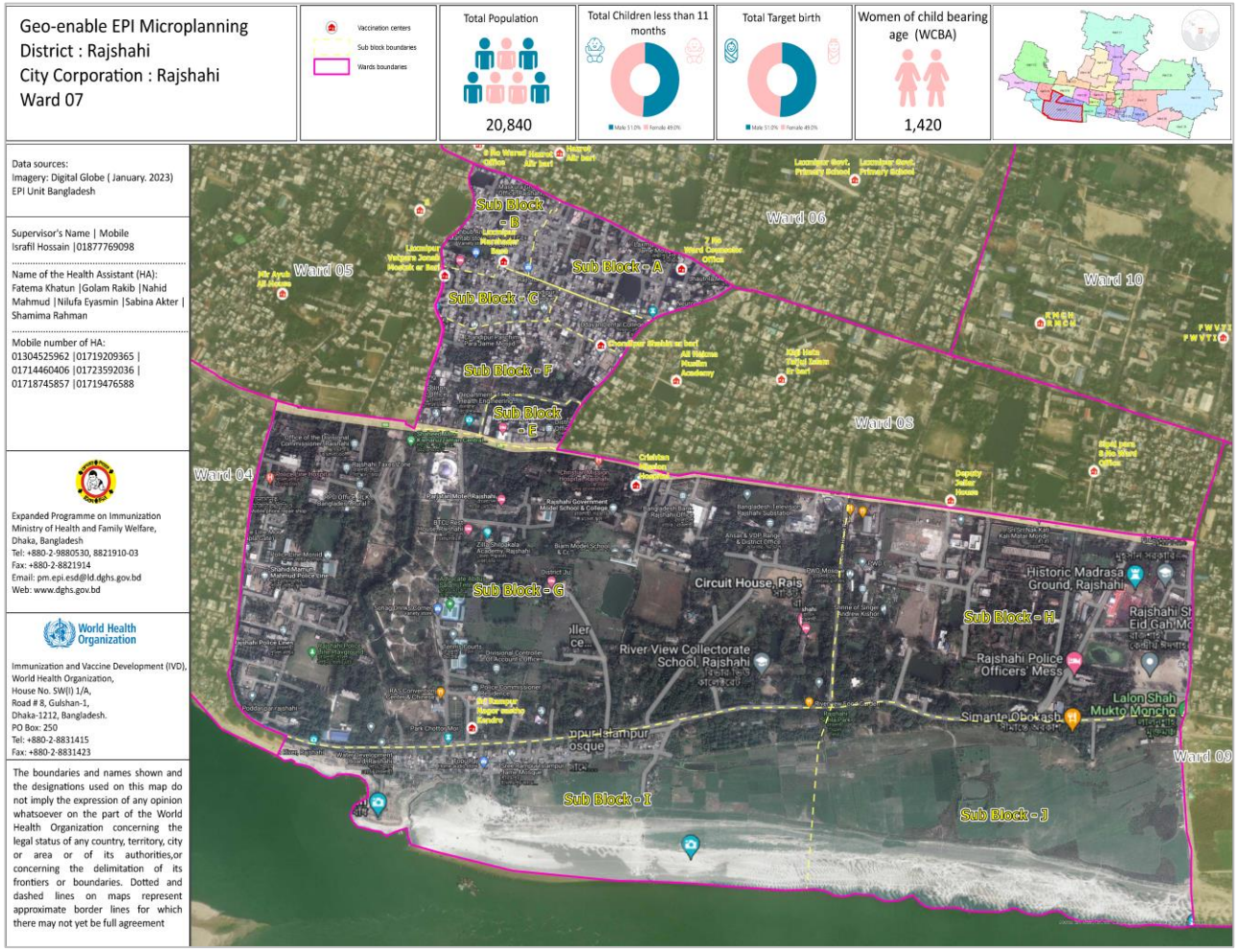
MAINSTREAM

- The success of the microplanning exercise is judged by the level of usage of the digitized boundaries in the day-to-day workflow
- Integrating the digitized boundaries and satellite maps in the operational plans
- Expand the microplanning exercise to other areas
- Print relevant maps and paste it in each health center
- Use the boundaries for IM and other post campaign activities

Rajshahi GIS Mapping & Microplanning Workshop

❑ Completed:

- ❑ 1. 300 Sub-block Polygons, 30 Wards Polygons & 6 Zone Polygon created.
- ❑ 2. 300 Vaccination Center Points mapped with Location Information (GPS)
- ❑ 3. 30 Wards boundary and 6 Zone boundary
- ❑ 4. EPI Digital Microplanning Dashboard

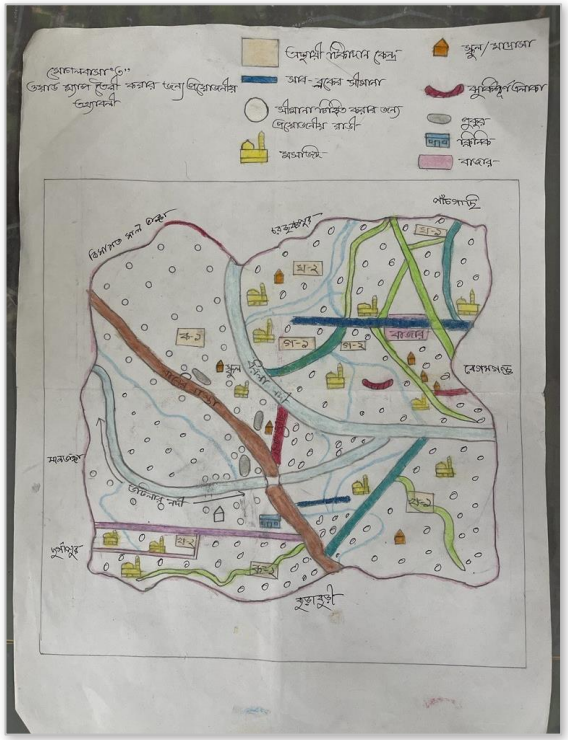


Rajshahi, Kurigram & Sirajganj Districts GIS Mapping & Microplanning Workshop

- GIS Mapping & Microplan Workshop in all the 19 Upazila and 1 City Corporation
- Average of 30 SIMOs & Data Managers Trained and Contributed to mapping workshop
- Mapped features include catchment boundaries and Vaccination centers
- Data Validation exercise conducted at the end of the Workshop

GIS Mapping & Microplanning Workshop

GIS Mapping & Microplanning Workshop

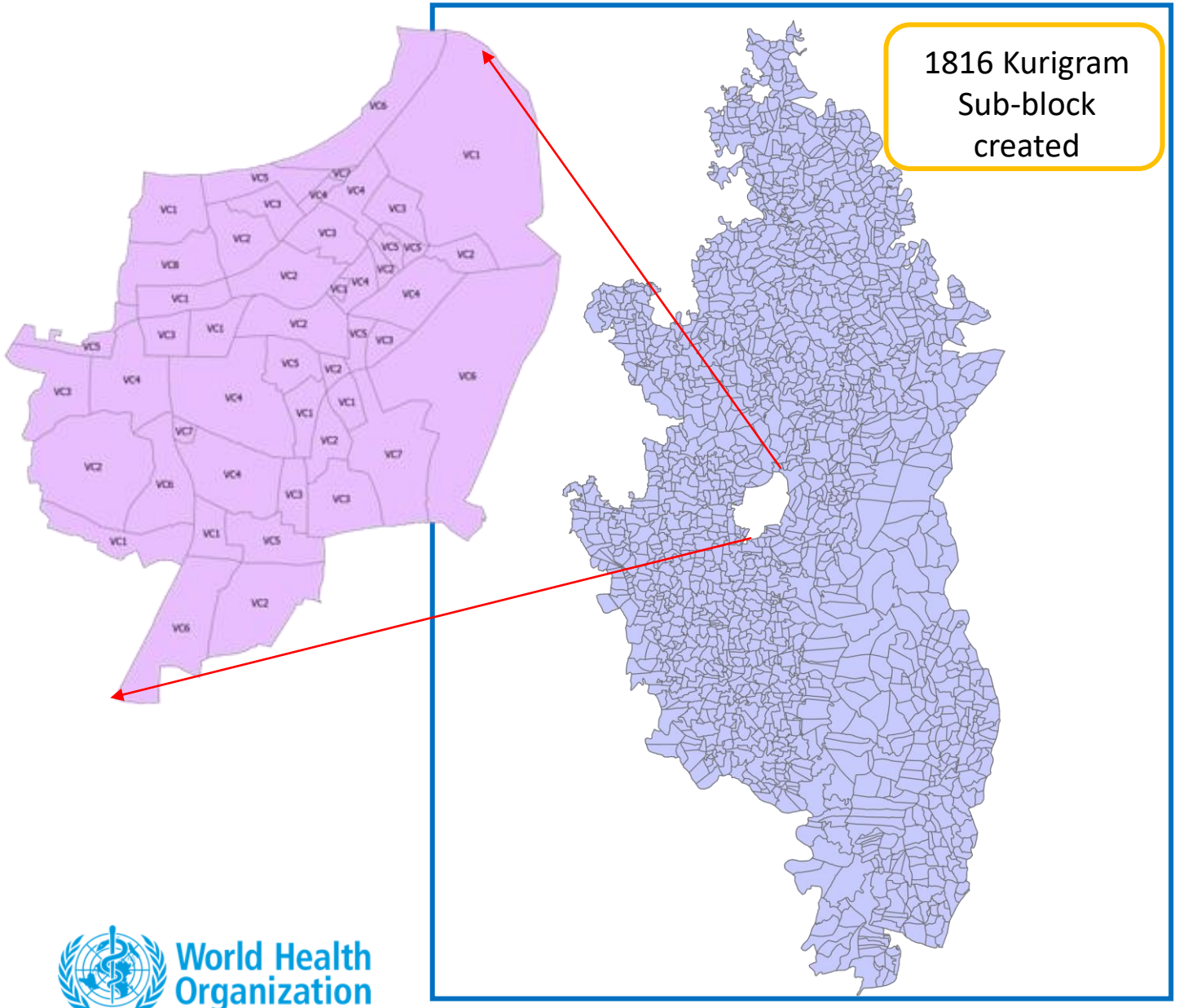


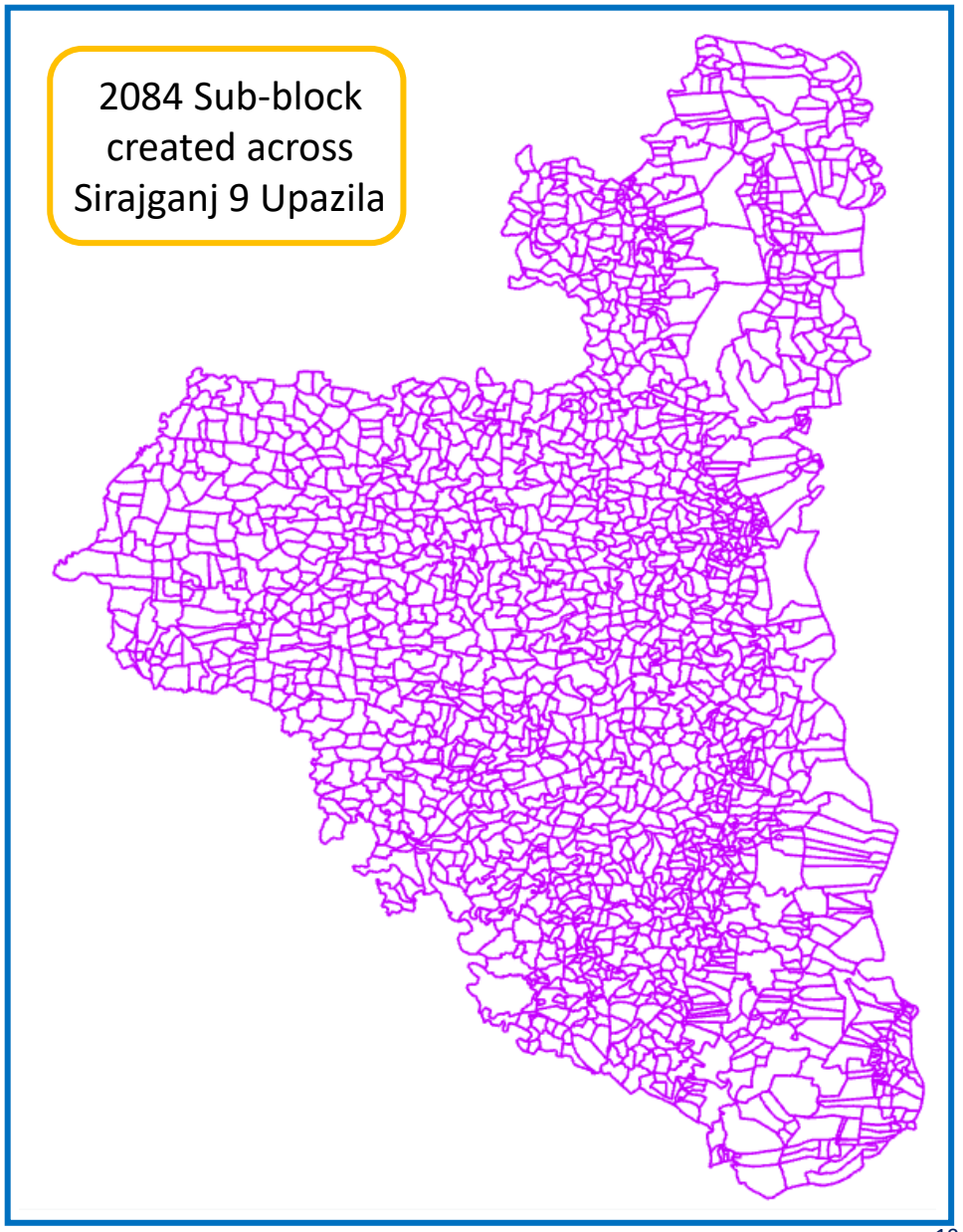
GIS Mapping & Microplanning Workshop Summary Report

Summary Report

GIS & Microplanning Activities in Bangladesh (Sirajganj, Kurigram & Rajshahi CC) Sept - Oct 2023					
Distirct / City Corporation	Upazila	Union / Zone	Ward	Sub block	Vaccination Center
Sirajganj	9	88	280	2084	2104
Kurigram	10	75	235	1816	1818
Rajshahi City Corporation		6	30	300	170
Total	19	169	545	4200	4092

GIS Mapping & Microplanning Workshop Sub blocks





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Challenges & Opportunities with Adopting Geo-enabled Microplan Innovation

The use or adoption of Geospatial innovation to strengthen health systems, including planning for improved health coverage is driven by access to data, the availability of quality, granular geospatial datasets and resource personnel. Most of the time, this combination is difficult to have in low and middle-income countries.

Challenges:

- Unavailability and inaccessibility of quality, core geospatial data types (layers) that are "fit for a particular use"
- Familiarity and prior use of geospatial data for public health decision making
- Need to strengthen political buy-in and motivation to enhance decision making urgency
- Involvement of all stakeholders with well-defined roles and responsibilities to coordinate and complement existing efforts in advancing geospatial innovation use.

Opportunities :

- Granular programmatic (catchment) geospatial data was developed for the piloted districts.
- As part of the workshop, Field staff; SIMOs from WHO, Health Assistants from the Health Local Authorities and their Supervisors from MoH were trained in the use of GIS technology including reading and understanding maps. They also contributed immensely to the geospatial data development.
- The findings with the introduction of Geospatial approach to EPI strengthened engagement and commitment the Government decision makers, this provided an opportunity for further brainstorming and the need for urgent solutions to identified programmatic issues.

Lesson Learned and Recommendations

Lessons learned of digitalization and “geo-enablement

- Improved implementation and monitoring of campaigns
- Improved understanding of ground realities for stakeholders and national level programmes
- Improved coverage of hard-to-reach areas
- Reduce silos across teams
- Increase capacity of health workers and staff at all levels
- Gateway for digitalization in other work areas
- Efficient vaccine and vaccine storage management

Recommendations

- Scale up of the microplanning across the country
- Sustainability and maintenance of data
- Regular assessment of boundaries to ensure coverage, population distribution

Next Steps

- Cascaded training by WHO Bangladesh and ministry for continued microplanning
- Scale up of Geo-enabled microplanning process across the country

GISC Resources for geo-enabled microplanning

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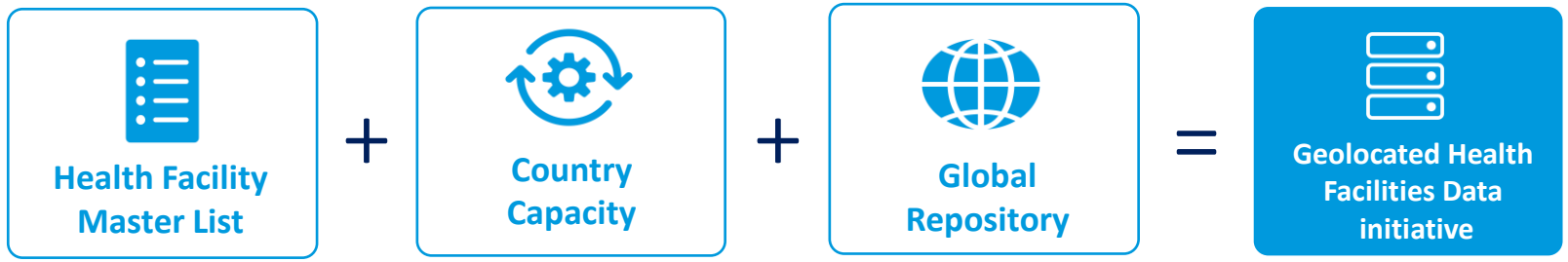
Geolocated Health Facilities Data Initiative (GHFD)

The GHFD initiative serves to:

- Goal: The **Ministries of Health (MOH)** are in a position to maintain, regularly update, and use the master list of health facilities for their respective countries.
- Mission: **Strengthen the technical capacity of MOHs** across levels to ensure the availability, quality, accessibility, and use of HFMLs.
- Establish a global repository that points to country lists that are managed and maintained by the MOH.



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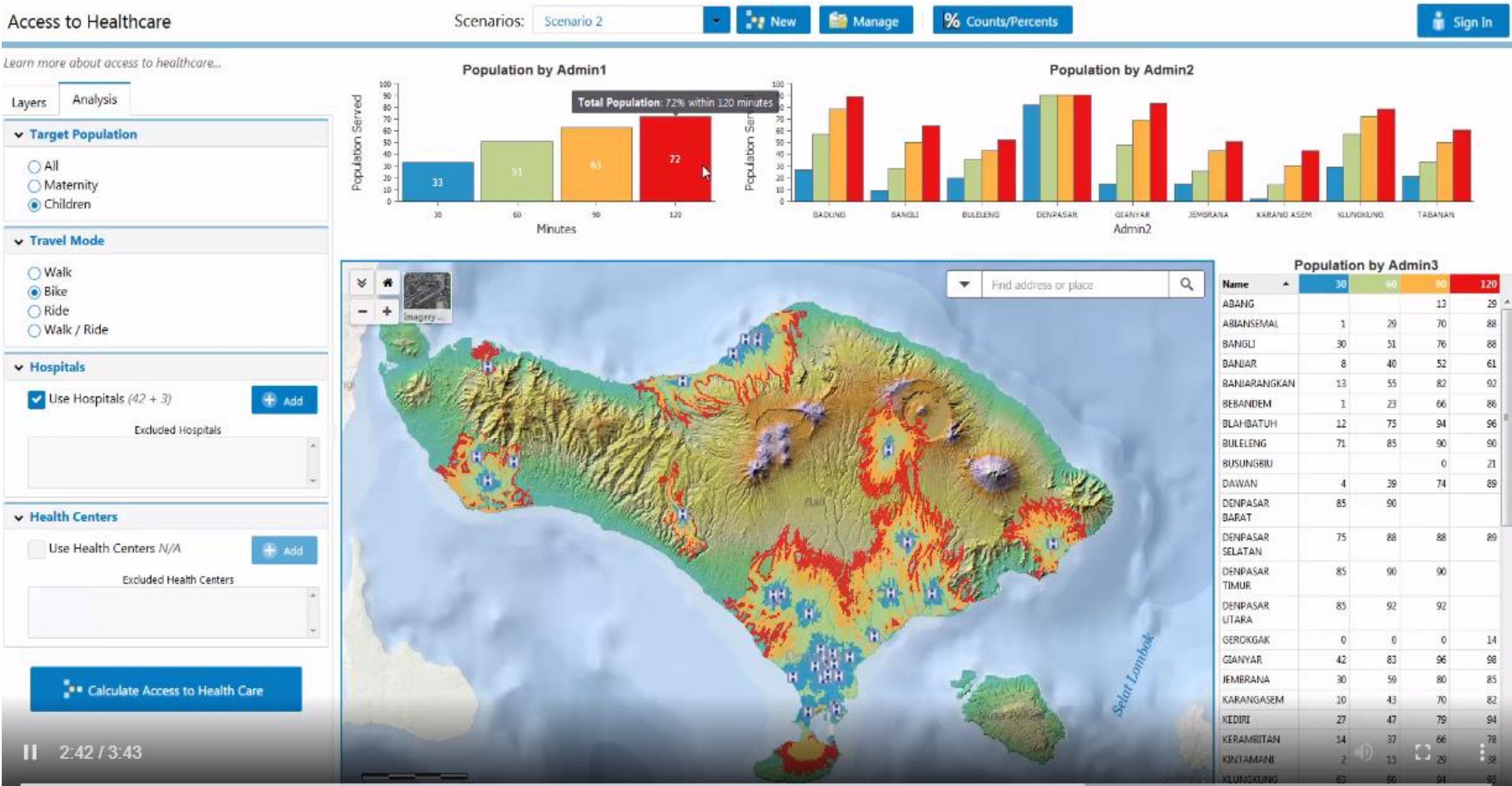
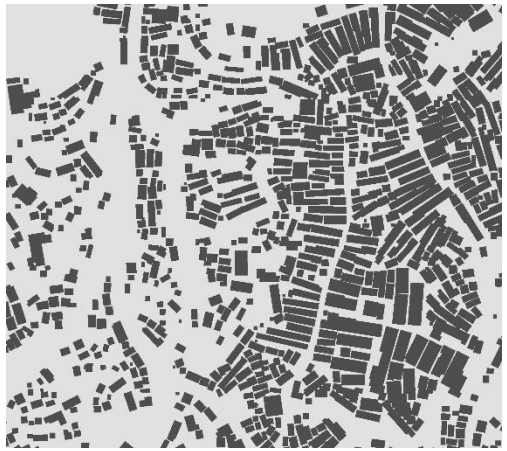
Modelling healthcare accessibility with AccessMod



ML/AI- tools: ABLE (AUTOMATED BUILDING LAYER EXTRACTION TOOL)

REPLICABLE AI FOR MICROPLANNING



Provides essential capacity to identify buildings; a pivotal layer to supporting humanitarian response

APPLICATION OF BUILDING FOOTPRINTS

Provision of Goods and Services
Essential for planning and delivering services to households

Population Density
Important statistics for development and humanitarian efforts

Sampling
For household surveys and mobile data collection campaigns

Data validation
Ability to validate locations and improve existing data

Risk Exposure
Knowing where people live and work is critical to assessing risks

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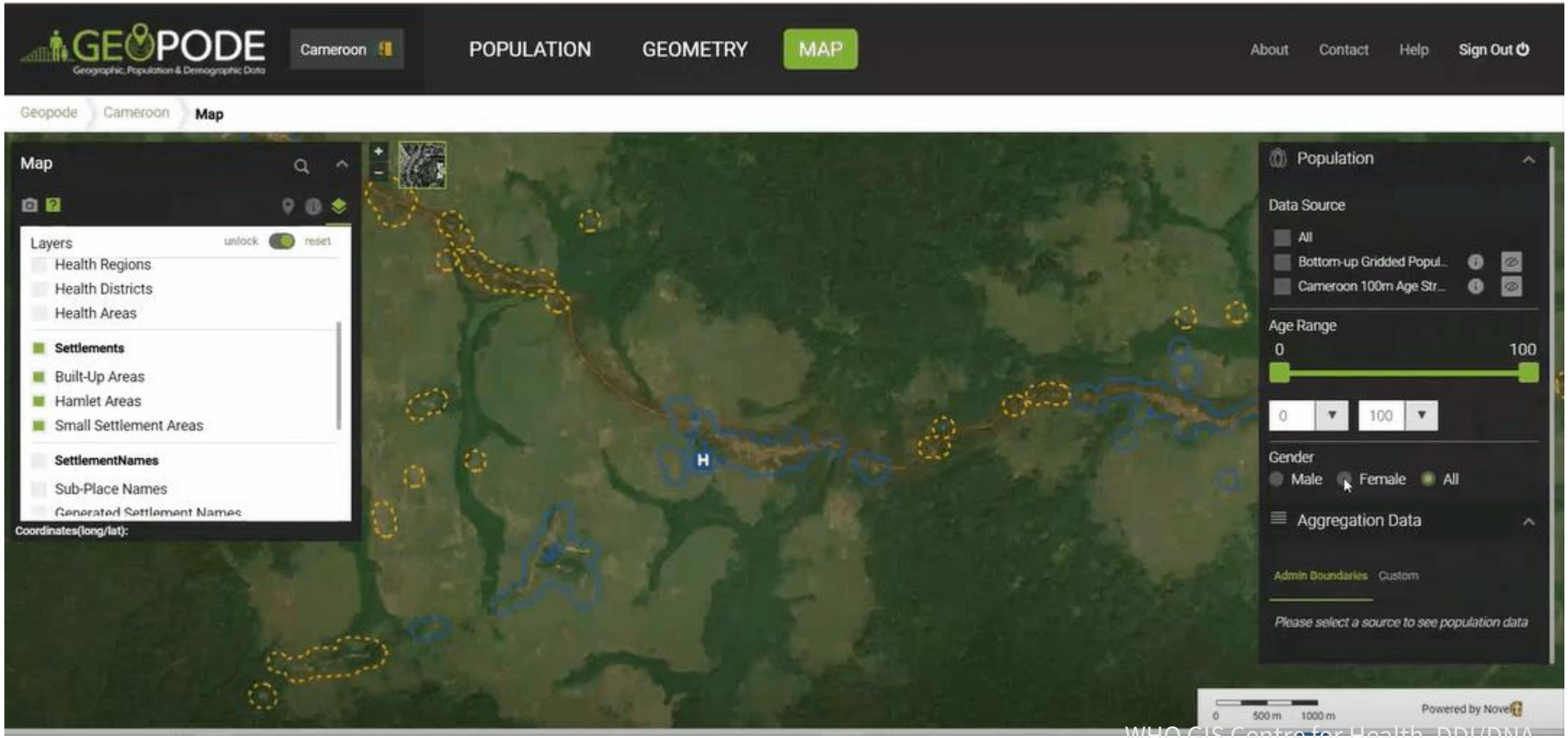
GeoPoDe

GeoPoDe (Geographic, Population and Demographic Data) is a tool to access geospatial data such as administrative boundaries, population and settlement areas on an interactive map viewer.



Geo-enabled Microplanning Handbook

Webinar/Panel discussion on Tuesday 15 November

Geo-enabled microplanning is the application of geospatial data and technologies to improve last-mile decision-making, ensuring that health services reach every corner of a community. Geographic information systems (GIS) enable microplanners to reach more households more efficiently, sustainably and equitably. The Geo-enabled Microplanning Handbook is a step-by-step resource to designing, planning, implementing, and sustaining a geo-enabled microplan, crowd-sourced from expert authors in the field and facilitated by the WHO-UNICEF COVAX GIS Working Group.

Join the GIS Centre for Health on **Tuesday 15 November from 2-3.30 pm CET** for a special webinar on the Geo-enabled Microplanning Handbook, featuring a panel discussion with WHO co-authors and champions from the Immunization, Vaccines and Biologicals team, and the Polio teams from the Regional Offices for Africa and the Eastern Mediterranean.

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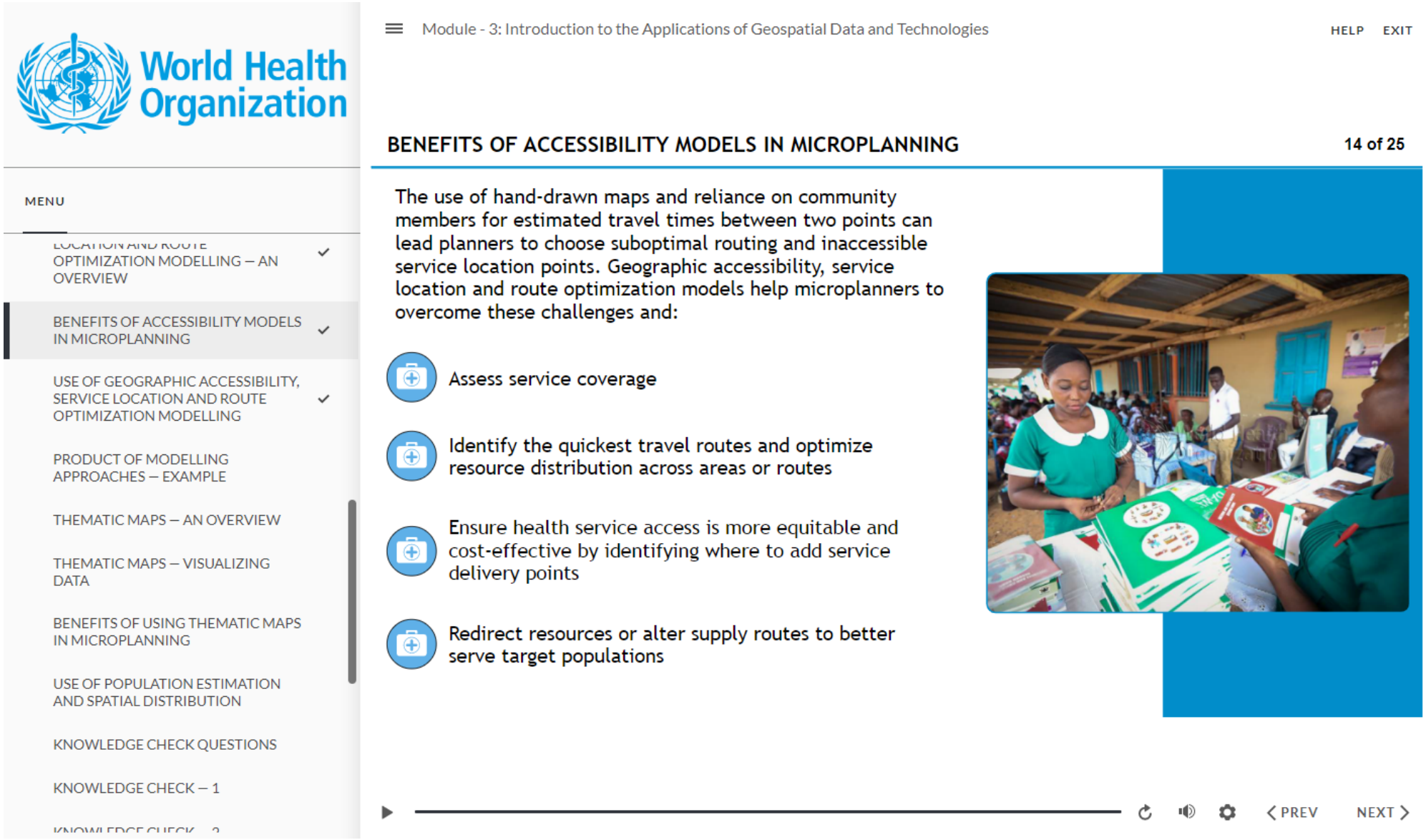
E-Learning Course for Geo-enabled microplanning



10 self-paced modules + 6.5 hours of content

Will be available in English and French

Content bifurcated for different users (technical or program managers)

Thank you!

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