







Geo-enabling Health Information Systems

and the part of the

UNICEF East Asia Pacific Regional Office, supported by TechNet-21, invites you to:



Learn how to geo-enable health information systems and programmes

Join us for a bi-weekly web-series starting 19 June 2024

Demonstrate the potential of geospatial data and technologies in public health

Introduce HIS geo-enabling framework and its implementation in countries

Provide knowledge and resources to implement the HIS geo-enabling framework



Go to <u>https://tn21.org/UNICEF-EAPRO</u> or Scan QR Code to Register

Ongoing registration

Joining any one session also permitted

6 Modules of around 2 hours each...except module 4

Certificates provided on completion by UNICEF & MORU

Workshop Objectives

Disseminate operational guidance materials that can assist countries in implementing the geo-enablement process for health programs in general and the development and implementation of micro plans in particular

More specifically:

- Demonstrate the potential of geospatial data and technologies in public health
- Introduce the HIS geo-enabling framework and its implementation in countries
- Transfer knowledge, expertise and resources that will allow participants to implement the HIS geo-enabling framework in their respective country
- At the end of this workshop, it is expected that the participants will have a better understanding of what geospatial data and technologies can bring to public health programs and how to geo-enable their health information system in a sustainable way to benefit from this type of data and technologies

This is not a GIS training



Regional training workshop evaluation form (max 10 min)

We	want to hear	from you!
	UNICEF Geo-enabling the Health Information System, programs or interventions training workshop - Evaluation form This form has been prepared to collect feedback from the participants to UNICEF Geo enabling the Health Information System, programs or interventions training workshop Please contact Steeve Ebener (steeve@tropmedres.ac) if you have any questions steeve.ebener@gmail.com Switch account	~
		* ear form



https://forms.gle/tRjSb1h33YSuLZiM8





Questions and knowledge sharing during the modules?

Question and Answer	Geo-enabling the Health Information System, programs or interventions	Meeting Chat 🖸 🔀
	Cuestions from participants	You to Everyone 11:35 AM
	steeve.ebener@gmail.com Switch account	Please post here any resource or experience you
Welcome to Q&A	* Indicates required question	would like to share here with
panelists will be able to see all questions.	Your full name *	the indication of your full name and country. Thanks
	Your answer	ç≠ @ ⁺ …
	Your country *	
	Your answer	
	Module to which the question refers to *	2 Who can see your messages?
	Choose -	
Type your question here		
	Your question: *	Type message here
Send approximately Cancel Send	Your answer	
	Submit Clear form	72 (c) C) C, V 🔽

Please post your questions in the Zoom Q&A (not the chat)

You can also ask questions using this short Google form (between modules for example)

We will answer them as much as possible during the modules

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You can share any resource or experience you see relevant to the participants in the chat

We will also be using the chat to share information

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Recap of Module 5



Introduction to Global Navigation Satellite System (GNSS)

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Introduction to the concept of registry and Common Geo- registry

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Introduction to Geographic Information System (GIS)

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Module 6



Agenda Module 6

15 min - Recap of Module 5 and agenda of Module 6

- 15 min Session 20: Define the strategy(ies) to be implemented to fill the gaps identified during the assessment
- 30 min Session 21: Develop the action plan aiming at filling the gaps in the HIS geo-enabling framework
- 30 min Session 22: Implement the action plan

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- 30 min Session 23: Assess, document and sustain the result of the action plan implementation
- 15 min Session 24: HIS, program or intervention geo-enabling resources (recap and additional ones)

15 min - End of workshop

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Development and implementation of the action plan

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Session 20: Define the strategy(ies) to be implemented to fill the gaps identified during the assessment



Step 2 : Define the strategy(ies) to be implemented to fill the gaps identified during the



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The product resulting from this step will be a report or a table providing a strategy, or set of strategies, to be implemented together with the list of involved stakeholders and level of implementation to fill the gaps across the element of the HIS geo-enabling framework

This step is separated from the development of the action plan because such action plan might not be in the position to cover all the gaps that have been identified during the assessment

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 Useful to document all the strategies for a potential future iteration and/or a separated action plan

Step 2 : Define the strategy(ies) to be implemented to fill the gaps identified during the assessment

Enabling environment (HIS, program or intervention)

Framework element			Current level	Gap to	be filled	
Governance mechanism	No governance structure has been established	A governance structure is in the process of being established	A governance structure exists but is not operational at this time	A governance structure exists and is operational but not all health stakeholders are involved	The governance structure is fully operational and participates in the National Spatial Data Infrastructure	

Data availability, quality and accessibility (use cases, program or intervention)

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Data	Availability	Quality	Accessibility	Gap to be filled
Health facility master list	~	Geographic coordinates missing for 23% of the health facilities	~	Missing geographic coordinates to be collected
Road network	\checkmark	The layer has not been updated since 2018	\checkmark	Update the layer to contain the roads built since 2018
Population statistics	\checkmark	Unknow as data not yet accessible	×	Obtain the data and perform the quality assessment



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Step 2 : Define the strategy(ies) to be implemented to fill the gaps identified during the assessment

The HIS Geo-enabling Toolkit, and other guidance documents, considers two levels of implementation:

- 1. <u>National:</u> Implemented national wide, starting with the central before the sub-national level (e.g. the former serving as trainers for the latter)
- 2. <u>Pilot</u>: Implemented on a limited part of the country's territory
- The level of implementation of each strategy will greatly depend on country-specific context and on the size of the gap versus the availability of resources (financial, human, and physical) and organizational support to fill such gap.

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Size of the gap

Step 2: Define the strategy(ies) to be implemented to fill the gaps identified during the assessment

Annex 5 of the HIS Geo-enabling Toolkit has been designed to support this exercise and provides the following information:

- A list of potential gaps identified during the assessment are provided for each of the framework elements.
- Possible strategies to fill each of the identified gap.
- The minimum list of stakeholders to be involved
- The suggested level of implementation for each strategy

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The list is non-exhaustive but should contain the major gaps that could be expected when geo-enabling the HIS, a program or an intervention



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Framework element	Potential gap	Proposed strategies to fill the gap	Stakeholders to be involved	Recommended level of implementation National Pilot		
	The MOH has not yet defined/finalized its vision, strategy(ies) and/or action plan regarding the management and use of geospatial data and technologies in health	Define MOH's vision, strategy and action plan for geospatial data and technologies in concordance with the NSDI if in place	MOH (GDTMU, KHPs), development partners	X		
 Vision, strategy(ies) and action plan 	The MOH has defined its vision, strategy and action plan but they have not yet been captured in official documents	Document MOH's vision, strategy and action plan for geospatial data and technologies	MOH (GDTMU, KHPs)	x		
	The MOH vision, strategy and action plan have been documented but they are not yet implemented	Promote, support and monitor the implementation of MOH's vision, strategy and action plan for geospatial data and technologies	MOH (GDTMU, KHPs), development partners	x		
	The MOH has not yet established a governance structure to handle issues pertaining to the management of geospatial data and technologies	Establish such governance structure at the MOH level	MOH (GDTMU, KHPs)	x		
2. Governance	The MOH has established a governance structure but not all the key health programs and development partners are on board	Advocate for all the key health programs to be on board of the established governance structure	MOH (GDTMU, KHPs), development partners	x		
structure	The country does not yet have a NSDI	Use public health as an example that could support the establishment of a NSDI in the country	MOH (GDTMU, KHPs), National Mapping Agency, National Statistical Agency, development partners	×	x	
	A NSDI is in place but the MOH is not yet involved	Advocate for the MOH to be on board of the NSDI	MOH (GDTMU), governmental entity in charge of the NSDI	x	x	
	There is no central level Geospatial Data and Technologies Management Unit (GDTMU) within the MOH The technical capacity of the central unit is not	Support the development of such entity within the MOH with the objective to also support key programs	MOH (GDTMU), governmental entity in charge of the NSDI, development partners	x	x	
	sufficient to support its mandate					
3. Technical capacity	Key programs do not have sufficient technical capacity to support the implementation of their activities	Engage local (universities for example), regional or global partners in the strengthening of the MOH technical capacity (training)	MOH (GDTMU, KHPs), development partners, private sector and academe	x	x	
	Technical capacity exists in both the central unit and key health programs but they are disconnected	Promote for the different entities to collaborate in order to avoid duplication of efforts and ensure for the same geography to be used across programs	MOH (GDTMU, KHPs)	x	x	

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Framework element	Potential gap	Proposed strategies to fill the gap	Stakeholders to be involved	Recommended level of implementation		
				National	Pilot	
	Data specifications, standards and protocols have been defined as part of the NSDI but they are not implemented within the health sector	Support the transfer of the defined data specifications, standards and protocols from the NSDI to the health sector	MOH (GDTMU), Governmental entity in charge of the NSDI	x		
	The MOH's data specifications, standards and/or protocols are not aligned with those defined by the NSDI	Collaborate with the governmental entity in charge of the NSDI to reach an alignment and support the implementation of the changes among MOH key programs	MOH (GDTMU), Governmental entity in charge of the NSDI	x		
 Data specifications, standards and protocols 	There is no NSDI in place and the MOH has not yet defined any data specifications, standards nor protocols	Define and document the data specifications, standards and protocols pertaining to the management and use of geospatial data and technologies	MOH (GDTMU, KHPs), development partners, academic sector	x	x	
	Data specifications, standards and protocols have been defined by the MOH but are not yet captured in an official guideline	Review the specifications, standards and protocols and document them under the form of a guideline	MOH (GDTMU, KHPs), development partners	x	x	
	Data specifications, standards and protocols have been defined at the MOH level (HIS) but these are not yet being used by key health programs	Support the use of data specifications, standards and protocols defined at the MOH level across key health programs	MOH (GDTMU, KHPs), development partners	x	x	
	No list exist Different programs/units within the MOH maintain their own separated list (no master list)	Promote and implement the concept of master list within the MOH	MOH (GDTMU, KHPs), development partners	x	x	
	The elements characterizing the master list (definition, data dictionary, classification tables, coding system, etc.) have been defined but not applied to the master list	Apply the elements that have been defined to the corresponding master list	MOH (GDTMU, KHPs), development partners	x	x	
5. Master lists and common geo-registry	The first version of the master list has been created, and the associated geospatial data compiled, but gaps need to be filled to improve their quality	Define an implement a data collection/extraction exercise to address the gaps that have been identified	MOH (GDTMU, KHPs), governmental entity having the curation mandate over the list and/or associated geospatial data, development partners	x	x	
	Existing gaps in the master list, and associated geospatial data, have been filled but there is no updating mechanism in place	Define, document and test the updating mechanism	MOH (GDTMU, KHPs), governmental entity having the curation mandate over the list and/or associated geospatial data, development partners	x	x	
	The Ministry of Health does not have access to a CGR or a set of individual registries fulfilling the functions of an CGR	Promote and implement the concept of Common Geo- Registry within the MOH	MOH (GDTMU, KHPs), development partners	x	x	

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Framework element	Potential gap	Proposed strategies to fill the gap	Stakeholders to be involved	Recommend impleme National	led level of ntation Pilot
	Use cases, business requirements and functional requirements for the CGR or individual registries have been defined, documented and approved but not yet used to identify appropriate IT solution(s)	Finalize the process aiming at identifying the	MOH (GDTMU), MOH programs and other governmental entities having the curation	x	
	Possible IT solution(s) matching the business and functional requirements have been identified but no decision has yet been taken regarding which one to deploy/develop	as CGR	mandates over the CGR content, entity to manage the CGR once deployed/developed	^	
5. Master lists and common geo-registry (continued)	The most appropriate IT solution(s) has/have been selected but has not yet been deployed/developed The IT solution(s) selected to serve as CGR or individual	Deploy/develop, test and if necessary adjust the	MOH (GDTMU), MOH programs and other governmental entities having the curation mandates over the CGR, entity to manage	x	x
	registries has/have been deployed/developed but modifications must be made to meet business and functional requirements	appropriate IT solution(s) to serve as CGR	the CGR once deployed/developed, IT solution(s) vendor(s), development partners		^
	The Ministry of Health has access to a CGR or a set of individual registries complying with all the business and functional requirement but it/they is/are not yet operational	Operationalize the fully compliant deployed/developed IT solution(s)	MOH (GDTMU), MOH programs and other governmental entities having the curation mandates over the CGR, entity to manage the CGR once deployed/developed, development partners	x	x
6. Availability of	The MOH central Geospatial Data and Technologies Management Unit (GDTMU) does not have access to the necessary geospatial technologies to support its mandate	Equip the central level unit with the appropriate geospatial technologies taking advantage of existing public-private partnership when applicable	MOH (GDTMU), development partners, private sector, open community and academe	x	x
geospatial technologies	The key programs do not have access to the necessary geospatial technology to support their activities	Equip the key programs with the appropriate geospatial technologies taking advantage of existing public- private partnership when applicable	MOH (GDTMU, KHPs), development partners, private sector, open community and academe	x	x
	The MOH does not recognize the importance of geospatial data and technologies	Promote and demonstrate the benefits of using geospatial data and technologies in the health sector (consultative meetings/capacity building workshops, national stakeholder summits etc.)	Development partners, private sector, academe		x
7. Use cases		Implement a use case based pilot project to demonstrate the benefits of geo-enabling the HIS	MOH (GDTMU, KHPs), development partners, private sector, open community and academe		x
	The importance of geospatial data and technologies is recognized but their potential is not fully used across health programs (no or limited number of use cases)	Demonstrate the potential of geospatial data and technologies that is currently not being used by the key health programs through the implementation of use cases	Development partners, private sector, academe		x

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Framework element	Potential gap	Proposed strategies to fill the gap	Stakeholders to be involved	Recommended level of implementation National Pilot	
7. Use cases (continued)	Geospatial data and technologies have successfully been used by key health programs but these use cases have not yet been documented or shared	Support the documentation of the use cases (two-pagers documents for example)	MOH (GDTMU, KHPs), development partners, private sector, academe	x	x
		Encourage the development and enforcement of such policy/policies	MOH (GDTMU, KHPs), development partners	x	x
8. Policy	The MOH does not have such policy/policies in place	Promote sharing of experiences and lessons from countries with more developed geospatial data and technologies related policy framework	MOH (GDTMU), National Mapping Agency, Ministry of Interior/Home Affairs, National Statistical Agency, development partners, open data community, private sector, academe	x	x
		Demonstrate the benefit of geo-enabling the HIS for the MOH to sustain resources on the long term	MOH (GDTMU, KHPs), development partners, private sector, academe	x	x
9. Resource for sustainability	The MOH does not have the necessary resources to sustain its activities	Encourage the MOH to include resources for geospatial data and technologies in their regular budget	MOH (GDTMU, KHPs), development partners	x	
		Support resource mobilization based on a clear action plan with timeline and budget	MOH (GDTMU, KHPs), development partners	x	

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Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

Session 21: Develop the action plan aiming at filling the gaps in the HIS geo-enabling framework



Step 3: Develop the action plan aiming at filling the gaps in the HIS geo-enabling framework



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At the end of this step, the Ministry of Health should have a clear and costed action plan containing all the information needed for a successful implementation

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Develop the action plan – Origin of its content



Action plan to fill the identified gaps



Develop the action plan - Content

The action plan should at least contain:

- The vision (short and/or long-term)
- The objectives to be achieved
- The timeline (start and end date) and full name of the implementation manager
- The date of last update of the plan
- For each element of the HIS geo-enabling framework:
 - The current situation/gaps as identified during the assessment (a comments field to provide additional information can also added)
 - The strategy(ies) to fill the identified gaps
 - The level of implementation of the strategy(ies)
 - The activities associated to each strategy with the mention of the following for each of them:
 - The entity, individuals to involved in the activity (target group)

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 Person/entity in charge of the activity (responsible)

- Timeline (start and end date)
- Budget
- Anticipated deliverable(s)

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Monitoring and evaluation indicators

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Develop the action plan - Template

To help this process, the Health GeoLab has developed a MS Excel template accessible from the HIS geo-enabling toolkit

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1	Short/long term vision										
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									inceps.		
2											
4	Action plan objectives										
5	1										
6	2										
7	3										
8											
9	Implementation period:		I	Implementatio	on manager:						
10											
11	Action plan last update:										
4.1	· · · · · · · · · · · · · · · · · · ·										
1:	Framework Flement 2: Governance Structure										
1	Current situation/gans:										
14	Commonts:										
1	Stratom/lios):										
17	Implementation level:										
18	ACT. # ACTIVITY Descrition	larget group	Responsible	Start date	End date	Budget (USD)	Deliverable	Wike Indicator	Sta	us	Notes
19	2.1	00								-	
20	2.2										
21	2.3										
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To be defined through a consultative process involving the concerned stakeholders

Information coming from the HIS geo-enablement level and the identification of strategy(ies) to fill gaps

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Develop the action plan – Process to fill the template

- 1. Decide on the approach that will be used to fill the template and on the stakeholders to be involved. For example:
 - a. In-person or remote workshop involving all relevant stakeholders
 - b. Small group developing a draft action plan to be reviewed and approved by all relevant stakeholders
- 2. Implement the selected approach:
 - a. Define the short and/or long term vision
 - b. Define the objectives of the action plan

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- c. Transfer the information from HIS geo-enabling level assessment matrix to the action plan template
- d. Transfer the strategy(ies) and corresponding implementation level that have been defined during the previous step to the action plan
- e. Define the activities that must be implemented for each element of the geoactivation framework together with the indication of the target group, responsible, timeline, deliverable(s), M&E indicator and possible notes
- f. Cost the action plan and nominate an implementation manager if not already done

Develop the action plan – General considerations

Experience shows that it is important to take the following into account when developing the action plan and this to ensure not only a successful implementation but also long-term sustainability:

- Be as inclusive as possible from the start of the process by engaging in the process not only the key health programs identified during the assessment but also development partners who might currently be supporting projects with a geo-enabling component or interested in doing so.
- Have at least one **focal point** officially nominated for each MOH entity and the partners involved in the implementation of the action plan
- Make sure that the action plan in general and the use cases (applications) in particular **address public health priorities** included in the National Health Plan.
- **Build on already existing** action plan(s), taking the results of the HIS geo-enabling assessment into account.
- Leverage local MOH champions who have understood the value of the geo-enablement and have a clear view on their needs for geospatial data and technologies.
- Use local capacities (national consultant, universities, private companies, etc.) as much as possible, not only because this reduces costs but also allows a closer follow-up on the implementation as well as helps in addressing potential language issues.
- Prefer long term coaching to one-off training sessions.

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- Start by **strengthening the central level before the subnational level** for the central level to then serve as trainers and point of contact for the sub-national level.
- Use the implementation of the **use cases (applications) as the driver** to strengthen the technical capacity of the MOH.
- Get the MOH staff to do as much of the work as possible with the support of the national and international consultants. This will contribute to the strengthening of their technical capacity and to experience firsthand potential data and process related issues.
- Even if the resources are available for a full-scale implementation, it might be better to **implement the action plan in phases** and to only go for a full-scale implementation only once sufficient capacity has been established at the central level. The implementation of a pilot project also presents the advantage of giving a clearer picture of the activities, resources, time, etc. needed to expand the implementation to the whole country.
- **Do not implement an action plan spanning further than 12 months** (8 to 9 for a pilot project) to have the opportunity to regularly assess and adjust the plan if needed.

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- Anticipate unexpected delays in the implementation of the activities and try to come up with a timeline that would be flexible enough to absorb these delays as much as possible.
- Think about the **sustainability o**f the technical capacity and other common assets developed during the implementation of the action plan.

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Develop the action plan - Vision

Geo-enable the Health Information System to generate quality data that can be used to better plan priority health interventions and improve the health status of the population by 2030.

Have an accessible geospatial information of quality to improve the health of the population

By 2030, the necessary geospatial data, technologies and services are available, of quality and accessible in a coordinated way to support the implementation of the National Health Plan towards achieving Universal Health Coverage





Develop the action plan – Objectives and implementation period

- The vision can be for the long term but the action plan aiming at only covering part of this vision (e.g. vision going until 2030, action plan only covering the 2024-2026 period
- 2. The objectives should be:
 - Based on the result of geo-enabling level assessment
 - Clear and achievable during the period set for the implementation of the action plan



Action plan objectives

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- 1. Strengthen the technical capacity of the MOH at the central level when it comes to the management and use of geospatial data and technologies
- 2. Demonstrate the benefits of geo-enabling the HIS through a pilot project covering two uses cases

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- 3. Make the case to extend the pilot project to the rest of the country and institutionalize the capacity that has been developed down to the sub-national level
- Implementation period: 01.01.2025 31.12.2029



Develop the action plan – Transfer the information from HIS geoenabling level assessment matrix to the action plan template

The information to be transferred for each element of the strategic framework is:

- 1. The current situation/gaps
- 2. Any potential comments provided in relation to that situation

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Develop the action plan – Transfer the strategy(ies) and corresponding implementation level to the action plan template

The information to be transferred for each element of the strategic framework is:

- 1. The strategy(ies) that has/have been defined to fill the gap
- 2. The implementation level that has been defined at the same time

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13	Framework Element 2: Governance Structure	
.4	Current situation/gaps: The MOH has not yet established a governance structure to handle issues pertaining t	o the management of geospatial data and technologies
15	Comments: An attempt to estabish a governance structure took place back in 2020 but it did not get approved	
10	Strategy(ies): Create a technical working group to support the implementation of the use case pilot project as t	he starting point to establish a sustained governance structure
17	Implementation level: National (central level)	



After this step, the contextual information for each element of the HIS geoenabling framework will be completed in the template





The part of the process that will most probably take the largest amount of time when developing the action plan

Several things to accomplish for each element of the HIS geo-enabling framework:

1. Identify and document the activities (Description)

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- 2. For each activity:
 - a. Determine at least one deliverable
 - b. Define the entities/indivudals to be involved (Target group)
 - c. Nominate an entity/individual to lead the activity (Responsible)
 - d. Define at least one M&E indicator
- 3. List the activities in the chronologic order and define the timeline (start and end date)

32	Act. #	Activity Descrition	Target group	Responsible	Start date	End date	Budget (USD)	Deliverable	M&E indicator	Status	Notes
33	2.1	Hold a half day meeting to present the results of the HIS geo-enabling assessment, discuss and finalize the plan of action and establish the technical working group for the use case pilot project	MOH Key health programs	International consultant	15 Jan 2025	15 Jan 2025		Meeting executive summary	Meeting executive summary released before the end of January		
34	2.2	Finalize the terms of reference for the technical working group	MOH Key health programs members of the technical working group	National consultant	15 Jan 2025	31 Jan 2025		TOR	Final technical working group TOR released by Jan 31 2025		



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To help this process, the Health GeoLab has developped a generic list of possible activities for each element of the HIS geo-enabling framework.



This list has been generated based on the implementation of in-country projects and is accessible from the HIS geo-enabling toolkit (<u>https://bit.ly/3taPQ7d</u>)

	A	В	с	D	
1	General		Master lists		Geospatial data associated with
2	Under the umbrella of the governance structure, create a working group on master lists and the Common Geo-Registry (CGR)		Identify the government entity with the mandate to manage, maintain and update each master list		Compile existing geospatial data
3	Develop the terms of reference (TOR) of the working group on master lists and the CGR		Data dictionary and associated classification tables		Clean and homogenize the data tl
4	Have the terms of reference of the working group on master lists and the CGR approved		Review the existing data dictionary and associated classification tables for the master list to identify potential data element gaps		Evaluate the quality of available g layers (polygon geo-objects) base
5	Identify and involve stakeholders in the group on master lists and CGR		Develop the data dictionary and associated classification tables for the master list		Select the most relevant geospati
6	Organize regular meetings of the master list and CGR working group		Update/adjust/complete classification tables to contain all relevant classes		Identify and document gaps in the
			Obtain the validation and approval of the data dictionary and associated		4 1
	+ \equiv e \star Policies \star Financial resources \star N	orms, s	tandards, SOP 🔹 Technical capacity 👻 Technologies 👻 Ma	ster list	<

The activities linked to the operationalization of the following applications are to be captured under the "Use case" element of the framework

Population estimation and spatial
distributionGeographic accessibility, service localization,
and route optimization modeling

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Thematic mapping

Navigation and tracking using a GNSS

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Once all the activities defined for each element of the framework it is good to control the timeline consistency across all of them.

Developing a gant chart down to the activity level might be useful at this stage

Framework Element 2: Governance Structure Gurrent situation/gaps: The MOH has not yet established a governance structure to handle issues pertaining to the management of geospatial data and technologies Comments: An attempt to establish a governance structure took place back in 2020 but it did not get approved Strategy(ies): Create a technical working group to support the implementation of the use case pilot project as the starting point to establish a sustained governance structure Implementation level; Act. # Activity Descrition Target group Responsible Status Notes																						
2.1	Hold a half day meeting to present the results of the HIS geo-enabling assessment, discuss and finalize the plan of action and establish the technical working group for the use case pilot project	MOH Key health programs	International consultant	15 Jan 2025	15 Jan 2025	\$500	Meeting 20 executive summary before the end r		nmary released of January	Not started	A translator will be needed during the meeting. The travel cost of the international consultant is not included in the budget. The executive summary might need to be translated.											
2.2	Finalize the terms of reference for the technical working group	MOH Key health programs members of the technical	National consultant	15 Jan 2025	31 Jan 2025	\$0	Final technical working group TOR		ing group TOR	Not started	The cost for developing the document is covered under the	Sept	ember			October				Nove	mber	
	Organiza regular mostings of the technical working	MOH Key health programs				#	Framewo	rk Element			Activities	18.09	25.09	02.10	09.10	16.10	23.10	30.10	06.11	13.11	20.11	27.11
2.3	group	members of the technical	HIS unit	15 Jan 2025	31 Dec 2029				If needed, pure	ourchase of the GNSS-enabled devices to be used during												
						7	Geospatial technolog Master list : develop t health facility master municipal districts cor project	technologies : develop the first version of the ity master list for the soums and Jistricts covered by the pilot		Introduce the possibility for MOH units to use QGIS for thematic mapping during the first Working Group meeting Provide support to the MOH units who want to install and use QGIS including the sharing of the training material used last June Develop a draft data dictionary for the health facility master list Compile, review and integrate all available data sources into the first draft of the master lists (pilot project only) Get the list validated by the MOH (Soum and UB City) Assess the quality of the available geographic coordinates of health facilities Review and finalize the draft data dictionary with the MOH Review existing coding scheme (unique identifiers) and make recommendations according to best practices Define the SOP that will be used to collect the missing geographic coordinates and other information in the pilot project soums and municipal districts and integrate this in the field data collection SOP Train the data collectors in the Soums and Municipal districts Collect the data in the field Check/clean/organize the data collected in the field Integration of the collected data in the field source of the master list		t 										





The following activities may take more time than generally anticipated

- Engaging with other governmental entities and partners
- **Gathering existing data**, obtaining authorization to use and share it, as well as making it usable for selected application of geospatial data and technologies



- **Procuring** hardware and software, especially in some countries (it is recommended to start this process as soon as possible)
- **Translating materials** into local languages (e.g. standard operating procedures, training materials) and validating translation containing complex technical concepts and terms
- Training technical staff to manage and use geospatial data and technologies
- Collecting data in the field (can be impacted by weather and unexpected insecurities)
- Validating results from applications and integrating them into the microplanning process
- Securing local political support and awareness, and mobilizing in-country actors
- Embedding the geo-enabled products into the microplanning templates used
- Scaling data use and map comprehension trainings to local levels

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• Establishing systems that can accommodate data updates from local levels, as errors will likely be found while using data and require updating.



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33

Develop the action plan – Define the budget for all the activities in the action plan

The last step then consist in defining the cost of each activity as well as the following:

- Salary for the national and/or international consultant(s) as well as field data collectors when it applies
- Travel for the international, and in some cases, national consultant(s)

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- Allowance for the MOH staff attending the meeting, workshops and training if not located in the same city as well as for field data collectors when it applies.
- A good internet bandwidth at the MOH
- Online common drive (Dropbox for example) for the sharing of data among the members of the technical working group

Developing the budget to implement the activities according to the agreed upon timeline is a critical component of workplan development.

Budgets should be as detailed as possible. This will help avoid resource shortages during the geo-enablement process

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Develop the action plan – Define the budget for all the activities in the action plan

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Items to Consider When Estimating Costs

Appendix I. Item to be consider when estimating the cost for the geospatial related activities listed in the work plan

Activity	Item to be included in the costing
Geospatial data management Equipment (coftware	 Data manager/GIS technician salary as well as continuous education and participation to conference and training Regular update of the master lists for the geographic objects core to public health and immunization and their associated geography Availability of a common geo-registry for the simultaneous hosting, management, updating and sharing of the master lists Clis cafturors and MS endational and the simultaneous hosting.
Equipment/soltware	 Gis solutione and indicates GNSS enabled devices Laptop matching the minimum requirements of the GIS software being used and having enough hard disk capacity to store geospatial data (1 TB recommended) Separated large screen and external keyboard to facilitate the work of the technician and extend the life of the laptop Shared drive or enterprise geospatial server solution for data and product storage when having several GIS technicians
Training on geospatial data management and/or technologies	 Equipment used during the training (GNSS enabled devices, laptop with the GIS software) Good internet access in case some web based tools and/or data are being used Facilitator
Field data collection	Pilot study for testing data collection Field work planning and monitoring (visits and surveys) Field data acquisition software Salary for data collectors GIS expert (training and supervision) Workshops and materials for training in field data collection
Data extraction	 Purchase of satellite images or topographic maps Working time to digitize features from base maps (satellite images, topographic maps)



Costs and deadlines for activities to strengthen the geo-enabling environment



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Develop the action plan – Define the budget for all the activities in the action plan

Consider the following when developing this budget:

- Some costs will have to be covered before reaching the development of the workplan. These costs are usually related to consultants' working time and potential travel to support:
 - buy-in and initial kick-off of the microplanning geo-enablement process
 - determining microplanning challenges and whether they can be addressed through geo-enablement
 - assessing current geo-enablement level of the microplanning process
 - developing standard operating procedures and other guiding documents.
- Additional budget items related to launching the geo-enabling process include upfront costs such as purchasing hardware and software, training staff and field data collection. Other items will have recurring costs that should be considered to ensure long-term sustainability. These recurring costs can include data maintenance and update, software licensing and updating, hardware maintenance/replacement, data plan, power and printing.
- Data extraction or creation to fill data gaps, such as field work, is typically the most expensive item in a geoenabled microplan. Other elements for fieldwork will depend on data collection methods and could include:
 - vehicle rentals and petrol
 - insurance for staff and vehicles
 - staff per diem (food stipend, travel and lodging)
 - staff working time for training, workshops, and supervision (government and consultants)
 - data collection devices
 - software licence costs
 - monitoring
 - data quality control, validation and integrations.
- Depending on funding resources, there may not be sufficient scope to collect the necessary data to generate quality products. If this is the case, it might not be possible to generate some products defined earlier in the process (Section 6.3). The impact on geo-enablement would then have to be evaluated.
- In some cases, purchasing proprietary data such as satellite imagery or population statistics might be the most cost-effective option. When this is the case it is important to remember that the cost generally increases with the volume and/or the data type (e.g. resolution of satellite imagery).

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- Enough flexibility should be included in the budget to account for possible changes in the content and format of the products at the time of generating them.
- Investing in quality training and capacity strengthening for all relevant local personnel to be involved in geoenablement is key to ensuring long-term sustainability. It is also important to generate quality and relevant products through geo-enablement. The same applies to a lesser extent to purchasing and maintaining hardware and software.
- Printing may be costly and/or require specialized large sized printers. In some cases it might also be worthwhile to print maps on laminated paper to facilitate annotations (see Section 6.8.2.4 for more details)
- Financial resources will also be needed to sustain what has been established by institutionalizing the supporting environment (Section 6.9.1) as well as maintaining and updating the data and products that have been generated (Section 6.9.2). If the geo-enablement is only beginning, this cost might be difficult to estimate until the first set of products has been generated. See Section 6.9 for details on considerations on budgeting for long-term sustainability of geo-enablement activities.

Regarding the elevated cost of field data collection, microplanning teams should consider the relevant cost/ benefit of utilizing local health staff for field data collection (generally lower budget) versus hiring a technical organization.

Table 12 - Utilizing local health staff versus hiring technical partners.

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Pros	Cons						
Generally lower cost	Poor training with potential for poorer or inconsistent quality of data might require repeated data collection campaigns, offsetting the cost advantage						
Better long-term sustainability by building local capacity	Health staff manpower diverted from their routine duties, need to fit microplanning exercise into programmatic schedules						

HEALTH
Develop the action plan – Define the budget for all the activities in the action plan

Consider the cost of refresher trainings for personnel at central and subnational levels involved in field data collection, data management and updating. In addition, consider the GIS skills that might be required to enhance spatial data through digitization. These typically include:

- verifying and completing road network shape files
- quality checking low-level administrative boundaries for topological accuracy
- name tagging of satellite-derived settlement layers (this will require interaction consultation with districtlevel personnel).

The following can be considered if there is a need to reduce implementation cost, (e.g. when the budget available for the geo-enablement is tight and/or it is not possible to obtain additional external resources):

- Leverage as much as possible existing material, especially for standard operating procedures and training materials.
- Explore options for open-source and free software (grants, non-profit licences), but do not compromise functionality for cost. These software are the tools that create the critical data products that geo-enable a microplan, and are worthwhile investments in the programme's success. See Section 6.4 for details on types of software, and their pros and cons.
- Explore the possibility to use freely accessible data, including satellite imagery to be used as basemaps.
- If multiple devices are needed (e.g. GNSS-enabled tablets for field workers or supervisors) consider buying in bulk for a discounted price.
- If access to the Internet is needed while in the field, consider buying the service in bulk unless logistically challenging (some countries restrict the ability to do so without permission).
- Consider alternative approaches for data collection that may still be able to fill gaps (e.g. use satellite imagery and local knowledge to locate health facilities or settlements, instead of sending teams into the field with GNSS-enabled devices).

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 Consider conducting a pilot instead of a national-level implementation for some of the initially planned activities. Provided in relation to immunization in general or microplanning but actually applicable to other programs or interventions

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Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

Session 22: Implement the action plan



HIS Geo-enabling framework implementation process

Step 4 : Implement the action plan





Before implementing the action plan

The following are the important issues to be addressed before the implementation of the HIS geo-enabling action plan:

- Make sure that all parties involved have a clear understanding of the action plan in general and of each of the activities it contains in particular
- Get a **focal point** to be officially nominated for each of the parties involved in the action plan implementation (if not already done through earlier in the process)
- Develop and give access to a **shared contact database** for the focal and other key person from the ministry to facilitate communication
- Clearly define the **roles and responsibilities** of each involved party (focal points, consultants, development partners, etc.). Develop terms of reference when necessary and ensure that someone oversees the specific activities to take place during the action plan implementation (see next set of bullet points).
- Define the **mode of communication** between parties taking potential language issues into account. This is particularly important when parties are in different locations during the implementation (international consultant for example).
- Establish an **online common working space** (using Dropbox for example) to facilitate the sharing of files among the MOH staff and the consultants.

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During the action plan implementation

It is important to do the following during the implementation of the HIS geo-enabling action plan:

- Keep track of the action plan implementation to ensure that the implementation remains on track based on the establish timeline and that the activities do not go outside the approved scope of the action plan (the HIS geoenabling action plan template can be used for that).
- Ensure that someone is **managing the overall flow of financial resources**
- Manage potential risks that could threaten the success of the implementation of the action plan
- Ensure proper flow of communication among the involved parties through regular on-site visits and teleconferences



Address input data availability and quality issues

Steps to ensure that the highest quality data or information is collected and produced:



- 1. Develop and implement clear and easy to understand standard operating procedures (SOPs) detailing each step of the process for data collectors and supervisors. Conducting a test run of the SOP with people who are not familiar with it could help to validate the procedures, especially for approaches that have never been implemented before
- 2. Define **monitoring**, **quality control and/or validation measures** that can be implemented on site or remotely, depending on the approach
- 3. Select operators or field data collectors with the appropriate **technical skills**
- 4. For field data collection, check that mobile devices are **functioning properly**

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- 5. Develop **training materials adapted to participants** and make sure participants understand and adhere to the SOP by conducting practical exercises during training
- 6. Provide operators and data collectors with **printed copies** of SOPs, as well as contact details of support staff, in case they encounter technical problems during field data collection
- 7. Implement **monitoring and quality control measures** as soon as implementation starts and throughout the entire process, making sure to address potential quality issues as soon as possible.
- 8. If possible, conduct a **validation exercise**. While the exercise's main objective is to build trust in the quality of the data that has been collected, it may also help identify issues to address before using data, (e.g. data entry errors, location data error, inconsistencies with other geospatial datasets)

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The operationalization of the applications of geospatial data and technologies can start once data availability and quality issues have been sufficiently addressed to generate the products defined at the beginning of the process



Operationalizing the applications is often done in the following order, due to the interdependencies that exist between the applications and to avoid implementation in silos:

- 1. Finalize georeferenced master lists, as the content of these lists, together with the associated geospatial data, are key to operationalizing the other applications
- 2. Generate spatial distribution and estimates for the target population next, as this data and information are needed to conduct geographic accessibility analysis and route optimization analysis
- 3. Conduct geographic accessibility, service location and route optimization modelling, using geometry stored or associated with master lists and population distributions as key input datasets

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4. Generate thematic maps based on results from the other three applications

In some cases, especially for emergencies or time-constrained cases, the creation of thematic maps can take place earlier

It is important to answer the following question for each product once generated:

- 1. Do the products help address the challenges identified at the beginning of the process?
- 2. Do they meet the purpose, content and format that have been defined, and are they presented in such a way that they can be understood by the intended audience?
- 3. Are there any limitations and/or gaps that could affect intake or decision-making when using the product and that are not documented on the product?

Answering these questions could be part of a product evaluation and validation workshop, facilitated by those who generated the products, and that brings together representatives from different stakeholder groups meant to use the products in planning or implementing the program or intervention.

During this workshop, participants should first be instructed how to read and interpret the content of the different products and understand their relation to the overall program/ intervention objectives and process





Georeferenced master lists

The data collected in the field since the beginning of the action plan implementation should be integrated into the corresponding master list as early as possible as these list serve as ground reference for the other data.

Once this is done, complete a quality check of each master list and associated geospatial data following the same process applied during the initial data quality assessment.

At the same time make sure to:

- 1. Adjust the label associated with each data element to match the one decided upon at the time of defining the content of each master list.
- 2. If it does not already exist, define and implement a unique coding scheme to identify each geographic object in the list. If multiple coding schemes are already used in a country, store each of them as a different data element (e.g. columns), giving priority to the official coding scheme.
- 3. Include in each master list:
 - a. The simplified data dictionary (data catalogue) including the associated classification tables if applicable.

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b. The metadata



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Georeferenced master lists

If the master list requires the geographic extension of each geographic object to be stored in a separate geospatial dataset (e.g. administrative units, health areas), consider the following:

- a. Ensure that the structure and content of the geospatial dataset attribute table matches the one of the corresponding master list (e.g. order of data elements, labels).
- b. Create the metadata for the geospatial dataset and, when possible, capture it either directly in the geospatial dataset file or in a separate file associated with it. In this metadata, make reference to the master list for users to have access to the complete data dictionary and classification table.





Thematic mapping

Thematic maps are the most visible products among those considered in the context of the HIS geo-enabling process



Special attention should be placed on creating these maps and their content

Process to be followed:

- 1. Import data into the GIS software
- 2. Select the appropriate mode of representation
- 3. Fix the symbology
- 4. Add labels to the map
- 5. Choose the map orientation (or map template)
- 6. Fix other elements of the layout to make the map usable
- 7. Save the final map in the appropriate format.

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✤ If needed, fix map elements outside the GIS software (with Adobe Illustrator for example after export)



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Thematic mapping

Aside from template-specific considerations, the following items should be considered independently from the format in which the maps created using the GIS software are being shared:

- Ensure that all the standard cartographic elements necessary to make the thematic map usable are included
- Prioritize "easy comprehension" over "beautiful design", as simpler maps are often more likely to be understood and used by their intended audience.
- If hand-drawn maps have been used previously, **include as many features** as possible from these hand-drawn maps when creating GIS maps, to facilitate uptake and understanding.
- **Name** the type of geographic objects in the map legend in the same manner as they are referred to in the corresponding master list.
- Ensure map **colours** do not consist of both green and red, as colour-blind persons will not be able to distinguish the difference.
- Not all elements need to or should be added to maps. Charts and tables with information, such as population totals or breakdowns, can be useful alongside a map.

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Thematic mapping

The following should be considered when using printed versions of thematic maps:

- <u>Map appearance</u>: When choosing label sizes, consider that not all map users may have good eyesight or have access to glasses.
- <u>Map size and printing</u>: Ensure that the map is either zoomed sufficiently on the area of interest, or large enough to effectively convey and display necessary information. Map dimensions will depend on the size of the operational area needed to support the intervention. If maps in smaller sizes are required, such as A4 or A3, optimize map colours for black and white printing in case colour printers are not accessible locally.
- <u>Map use and replicability</u>: In case the geospatial data or information on the map is incomplete, consider printing maps on laminated paper and providing stickers or erasable markers, so that users can make additions and suggest corrections to the map directly..

When shared in electronic format (e.g. pdf or jpg), users can zoom in and out of specific areas on a thematic map. This enables more detailed data to be observed in comparison to paper maps and can allow users to identify accuracy issues in datasets.

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Thematic mapping

Thematic maps shared as web maps may be set to allow users to zoom in and out, or to select which datasets should appear on the map. Users may also be able to dynamically query information attached to each geographic object on the map, or the value stored in each cell of a raster layer. However, these increased capabilities bring with them the need to ensure the quality of the geospatial data used, and of the information that can be queried through it.

Independently from the format being used:

- Establish a feedback or coordination system to ensure that data that are updated or changed on the map are also updated or changed in the central geo-registry or original dataset.
- Conduct map user interviews to assess 1) if the maps were used in the field, 2) how they were used, and 3) ways in which the maps can be improved for future use.





Integrate the products in a program and/or intervention

The primary products and associated information to be integrated include:

- The result of the conceptual data model exercise (e.g. definition and classification tables for the types of geographic objects used as the smaller implementation units)
- The master lists for the geographic objects core to the program and/or intervention.
- Tables and graphs presenting statistics and information resulting from population measurement and spatial distribution (e.g. target population distribution by subnational unit or health area) or geographic accessibility analysis (e.g. percentage of the target population with access within a given travel time)
- Thematic maps presenting the geographic location or extent of various geographic objects stored in the master list and/or the geospatial data that has been generated (e.g. population and travel time distribution)





Integrate the products in a program and/or intervention

The actions required to ensure integration of the products and associated information can ^L be broadly summarized as follows:

- Alignment between the definitions and hierarchies defined during the geo-enablement process, and the equivalent information contained in other information products utilized by the program and/or intervention (e.g. microplanning forms)
- Use the content of the master lists as denominator for the implementation of the program and/or intervention
- Inclusion of additional tasks arising from the geo-enablement in the official program and/or intervention SOPs and guidance distributed by the relevant authority overseeing the process (e.g. collect of the geographic coordinates of new vaccination points)
- Delivery of the maps, charts and tables produced by the geo-enabling process to the right user at the appropriate stage of the program/intervention process and with adequate training



Integrate the products in a program and/or intervention (example for microplanning)



The result of the conceptual data model exercise, especially the part aimed at identifying and defining the geographic objects key to the program/intervention might require adjusting or improving the associated forms and material. This kind of adjustment or improvement should be implemented in the planning phase of the process.

In Myanmar, this exercise allowed improvement of the classification used to define the different types of EPI communities to be covered during routine immunization and ensure that none of them were missed.

	Type of EPI community	Definition	Population presence status options long term		
	Ward	4th level administrative divisions encountered in urban areas and officially recognized by the GAD			
EPI	Village	Long term settlement officially classified as village by the GAD	long term		
community	Army	Settlement managed by the Ministry of Defense	short term, long term, seasonal		
assification	Camp	Settlement typically settled for displaced population (refugees or internally displaced population for example)	short term, long term		
	Workers settlement	Settlement setup by workers to live close to their place of work (plantation, factory, building site, mining site)	short term, long term, seasonal		
	Other settlement	Any other inhabited place not covered by the other definitions, including displaced and migrant populations	short term, long term, seasonal		

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Population presence status	Definition
Short term	Settlement setup for a period shorter than 1 year
Long term	Settlement setup for a period longer than 1 year
Seasonal	Settlement setup temporarily over the same period every year

Population presence status classification

Led to adjusting the content of the microplanning form and associated SOP



Integrate the products in a program and/or intervention (example for microplanning)

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Available georeferenced master lists of quality should be used by all the involved stakeholders at all stages of the microplanning process, not only because they provide the planning denominator (e.g. number of available health facilities, vaccination points or warehouses), but also ensure data interoperability across sources through the unique identifier (unique ID) set for all the geographic objects considered in the microplan, as well as the generation of thematic maps and other products geographically consistent across sources.

- The same version of the master list needs to be accessible to all stakeholders involved in the development, implementation and monitoring of the microplan
 - Registry or common geo-registry as well as printed version of the master lists in case internet is limited in the field
 - This should be accompanied by specific guidance and provision in the relevant SOPs for the proper recording and utilization of the unique ID in the relevant microplanning forms and other material



Integrate the products in a program and/or intervention (example for microplanning)

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Tables and graphs presenting statistics and information resulting from population measurement and spatial distribution, as well as geographic accessibility analysis, will themselves be used during the planning and reevaluation phases of the microplanning process

The analysis generating these products should be conducted as early as possible to allow for their use during the planning process

Thematic maps are intended to support the whole microplanning process and are suitable for integration at different stages and at different levels. Their applicability can result in more users than the products generated through the three other applications, and therefore require more comprehensive/diverse material to allow for their proper understanding and use

There will always be a need to facilitate the introduction of new products in the microplanning process. This will require: 1. The development of a guide on how to read, understand and use the product; 2. Training the staff using these products based on the guides developed under point 1; 3. Adjusting the microplanning material to describe where and how the new products should be used and for what purpose



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Integrate the products in a program and/or intervention (example for microplanning)



Once new products considered suitable for integration in the microplanning process there is a need to be decide if the timing is right for such integration. Reasons for the timing not being appropriate include but are not limited to:

- The emergency situation (e.g. disease outbreak) which might not allow enough time for quality products to be generated and/or introduced sufficiently to be understood and used correctly in the field
- The implementation of the microplan is already too far advanced to change the process on a large scale without risking a negative impact on its outcomes
- The change management required by the integration is more significant than initially anticipated, e.g. requiring more advocacy to take place

When this is the case, proceed with the integration at a lower scale (pilot) than initially planned or postpone the integration to the next microplanning cycle.

If the integration is postponed, it can be useful to capture feedback, comments and suggestions on the new products from the staff who will use them, not only to improve them, but also to facilitate their introduction during the next microplanning cycle





Short break





Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

Session 23: Assess, document and sustain the result of the action plan implementation



HIS Geo-enabling framework implementation process

Step 5 : Assess, document and sustain the result of the action plan implementation



Assess the result of the action plan implementation

The following challenges and lessons learned should be assessed and documented:

- 1. Difference in budget and timeline compared to what has been defined in the workplan.
- 2. Adequacy of technical capacity, and workload of personnel involved to operationalize the chosen applications.
- 3. Gaps in the standards, protocols and guidelines that have been used.
- 4. Insufficient or inadequate technology being used during data management, including data collection, and/or the generation of the products.
- 5. Issues in data availability, quality and accessibility that could not be resolved.
- 6. Difficulties by the intended users in reading, understanding, trusting and/or using the products that have been generated despite the documentation provided.
- 7. Inadequacy of the products that have been generate.
- 8. Insufficient support (hotline) during the use of the products.

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9. Adequacy of channels or avenues of communication and coordination between the personnel involved in various stages of the geo-enablement.

This exercise should be complemented by the measurement of the key performance indicators (KPIs) defined at the time of developing the action plan





Assess the result of the action plan implementation

A process should also be initiated to understand if and how the products generated through the geo-enablement have been used and, if yes, the impact this had on the program or intervention

- This could take place in the form of a survey, or interviews aimed at those who were meant to use these products
 - Document the impact of the geo-enablement



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- Children who received the full suite of recommended vaccines by one year of age increased from 43.8% in 2007-2008 to 69.8% by 2015-2016.
- Reduced delivery time for vaccines and supplies to sites, and reduced travel time for 45 nurses who had been seconded as field vaccinators.

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Might lead to the need to adjust some of these products, or to generate new ones, based on the feedback that have been received



Document the results of the action plan implementation

Documenting processes and lessons learned during the geo-enablement as well as its impact is a crucial step towards either scaling it up (pilot implementation) and/or institutionalizing it

It is preferable to develop the following set of documents:

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- 1. Overall process that led to the development of the geo-enabling workplan, starting from identification of the microplanning challenges to be addressed through the geo-enablement. This kind of report is important for those who invested in the geo-enablement
- 2. Details of technical processes followed including challenges and lessons learned when addressing data availability and quality issues; identification of the geographic dimension of the program or intervention and definition of the conceptual data model; and generating the products resulting from the operationalization of the applications of geospatial data and technologies. If data specifications and/or standards have been defined as part of the geo-enablement these should be documented at the same time.
- 3. Processes, feedback, challenges and lessons learned during the integration and use of the products in the microplanning process.

Useful from a reporting and auditing perspective and serve as reference material to be used by other countries

Document the results of the action plan implementation

Documenting processes and lessons learned during the geo-enablement as well as its impact is a crucial step towards either scaling it up (pilot implementation) and/or institutionalizing it

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RED/REC District-level digital health map co process Version 10 (tast update: 20.01.2023) 1. Introduction This document describes the process and provides the necess content necessary to general the first version of the digital h immunization for each dirtic in Mazmahoge.	unicof to every old ntent development say supporting material to obtain the sath map aimed at supporting routine		RED/REC digital heath map SOP for creating the first version concentration point master list Last update: 11.01.2022 1. Introduction The present document describes the process facility and concentration point master lists.	HEALTH unicef GEOLAB is revery drist on of the district's health facility and ts		RED/RE SOP to µ Last upp 1. Introdu The present of data medded initiative.	C digital heath map prepare the data for the accessibility ana date: 28.01.2023 action document describes the process to be implemented in ArcMap or M to conduct the accessibility analysis in the context of the RED/REC	lysis 5 Excel to prepare the ligital health map	
<text></text>	Ministry of Health of Mozami Geospatial data specification (remote sensing imagery) 27 September 2021	nbique ns and ground reference	 process starts with the creation of the 1 me for the concentration points. rocess to create the first v sing the first version of the health facil able information of quality in the RED/ consults from the Google wine folder (and the constraints) of the constraint of Constraint of the Constraint of Constraint of the Constraint of Constraint on Constraint of Constraint of Constraint on Constraint of Constraint of Constraint on Constraint Constraint of Constraint of Constraint of Constraint of Constraint of Constraint on Constraint Constraint of Constraint of Constraint on Constraint Constra	<image/> <image/> <text><text><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></text></text>	TH unicof () AB brownychia P) for collecting g concentration points situets applications to collect accurate and preci- boints in the field. SOP the health facilities and/or the health facilities and/or the health facilities and/or the health facilities and/or to be collected (to be pro- during the data collection tra- tailed and configured on the site of capture of the pro- during the data collection tra- tailed and configured on the site of the pro- during the data collection form): entials screenshots. h facilities and/or concentrat the district together with en- ties of capture in Annex entify for which health facilities ain to be collected.	eographic using the se geographic ' described in concentration wided to you ining. tablet (to be raining) c coordinates le Sheets and ion points for npty columns 1). It will also alities and/or	It composed of the the following geospatial data: Location of all the contentration points based on geographic commater list Location of all the health centers (Centro de Saúde) based on ge stored in the mater list Road network: Permanent revers Permanent revers District boundary District Boundary Pignal (SRID) Digital (Evention Model (DEM) Land cover Spatial distribution of the population for the specific age group Excel files are also needed: ziver classification table in the specifications Pignal Events in the second static state of the specific age group Excel files are also needed: ziver classification table in the specifications Pignal Events of the new two scenarios: Walking only for these two scenarios: It he results obtained through the accessibility analysis depends on in the apoperimate preparation of such data is therefore key to the port planning and decision-making. It an ead to be of quality across the following 6 dimensions: con didy, accuracy and consistency. wel of quality possible across these dimensions can be obtained by	RED/REC di SOP to con Last update: 1. Introduction Accession of the second of the second Accession of the second of the second of the second accession of the second of the second of the second accession of the second of the second of the second accession of the second	<image/> <image/> <image/> <section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>

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Document the results of the action plan implementation

It is also important to document the work that has been accomplished in a format that can be easily shared to :

- Demonstrate the benefit of the geo-enablement, especially in the context where some entities were not convinced in the first place.
- Leverage resources to either ensure the sustainability of what has been established, support the extension of the pilot project to the whole country, or finance the next round of HIS geoenabling activities.
 - Story maps, or similar media, provide an interesting option in this regard as it allows to include dynamic maps among other types of media





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Once the action plan implemented it is also important to look into:

- Storing, maintaining, improving and updating the data and products generated during the geo-enablement
- 2. Scaling up the geo-enablement process if the implementation has only been at the pilot project level until now
- Ensuring the long-term sustainability of what has been established during the geoenablement
- 4. Planning for the next iteration of the HIS, program or intervention geo-enabling process

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Storing, maintaining, improving and updating the data generated during the geoenablement

The storage, maintenance and regular update of the core data compiled and/or generated during the geo-enablement should ideally be included in the action plan

If this is not the case, it is important to look into this once towards the end of the action plan implementation because this data:

- 1. Provides a picture of the situation at the time of geo-enabling the HIS, the program or the intervention
- 2. Could be re-used by another program or intervention (e.g. routine immunization or subsequent public health campaigns) possibly outside the public health sector (e.g. education or nutrition programs).
- 3. If re-used they might need updating, which will be facilitated by proper storage and maintenance as well as the definition, documentation and operationalization of the corresponding updating mechanism

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Bring us back to the need for the proper set of registries or a common geo-registry to be deployed and sustained and the importance of the National Spatial Data Infrastructure (NSDI)



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Storing, maintaining, improving and updating the products generated during the geoenablement



The products that have been generated, such as the results of an accessibility analysis or a thematic map, should be stored in an organized way, ideally in the same backed-up repository as the one containing the data, together with associated key files (e.g. GIS projects used to create thematic maps) and metadata, enabling people to easily find, use and edit them as needed.

- Emphasizes the importance of documenting the details of the process used to generate or improve any given product, including the model(s) that have been implemented (Session 12). This documentation should be easily accessible and referred to in the metadata of the given products.
- Any significant change in the data (improvement, update) used to generate these products, as well as errors or need for adjustment identified during the use of the current version of these products, should ideally trigger their update.



Storing, maintaining, improving and updating the products generated during the geoenablement

The timing for implementing changes in the data and/or products will depend on the availability of the technicians who have the responsibility and necessary skills for the management of the data and/or the generation of the products.



The appropriate timing for replacing the old version of the products with the new ones should be decided on a case-by-case basis. For example:

- If the changes are not significant enough to have an impact on planning, implementation or monitoring of the intervention for which they are being used, they can wait until after the implementation in question.
- If the changes are significant and could have an impact on the intervention, the possibility to proceed with replacement will depend on difficulties in sharing the updated/improved data and/or products (e.g. low internet connectivity), as well as the confusion that such a change might introduce especially if the previous version has already been used.



Treating requests for modifications

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Independently from the mechanism that has been established, the feedback and requests received should be treated according to their nature. More specifically:

- Requests related to information captured in one of the **georeferenced master lists** should be channeled through the updating mechanism associated to these lists, ideally through the deployed registry or common geo-registry. This type of request includes, for example, new geographic coordinates collected in the field; identification of health facilities missing on the map and therefore in the master list, or that are not operational anymore.
- Feedback or requests related to the usability of the **thematic maps** (e.g. change of colours in the legend, or errors noticed outside of the map content itself e.g. typo in the title of the map) could be directly communicated to the technician in charge of updating the map in question, once the change has been approved for implementation.
- Feedback or requests related to the products on **population estimate or spatial distribution** or the results of the **accessibility analysis** might be more difficult to implement due to the complexity of the models and processes used to generate them. The pertinence and possibility to implement them should be assessed before implementation

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Scaling the action plan

If the geo-enablement has taken place under the form of a pilot covering only part of the country for some or all of its components, as decided at the time of developing the action plan and it has been successful, the possibility to scale it up should be considered.



- Such scaling up should take place based on a new action plan that builds on the results of the initial one, and will be developed using the same guidance and considerations as those described during the present training workshop
- At this stage care should be taken that any new knowledge arising from the pilot project is integrated into the new action plan, and that the technical capacities that have been established or strengthened during that same pilot are leveraged.

Depending on the geographic extent of the pilot project, the size of the country and/or the resources at disposal, the scaling up might either take place in phases or all at once to reach national coverage.





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Ensure long-term sustainability of what has been established

Institutionalization at both the program/intervention and health information system levels should be viewed holistically in the context of the first three stages of the HIS geo-enabling framework pyramid:



Supports the operationalization of any future use cases

The institutionalization should take place at the health system level and be aligned with the NSDI effort

 More cost-effective and facilitates coordination, collaboration, data quality among all partners

The program or intervention that has been geoenabled may also need to institutionalize the investments made in some specific technological solutions and technical capacities.



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Geo-enabling the Health Information System, programs or interventions training workshop for Asia Pacific

Session 24: HIS, program or intervention geoenabling resources (recap and additional ones)



Framework, implementation process and data management cycle



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cycle

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The HIS Geo-enabling toolkit

Designed as a tool to help countries assess their level of HIS geo-enabling and fill identified gaps



¹ https://www.healthgeolab.net/DOCUMENTS/HIS_geo-enabling_toolkit.pdf

Guidelines including/based on the HIS geo-enabling framework



Reference documents used for the development of the present training workshop material

1 https://www.unicef.org/media/58181/file

2 https://www.gavi.org/news/document-library/leveraging-geospatial-technologies-and-data-strengthen-immunisation 3 https://drive.google.com/file/d/1jj779zww4herWOESAd9mXqVE1YfQehtH/view?usp=sharing



The HIS geo-enabling framework in the 3 guidelines

	Guidance on the Use of Geospatial Data and Technologies in Immunization Programs	Rapid guidance for investment planning	Geo-Enabled Microplanning Handbook
Objective/purpose	Provide a non-technical introduction to the role of geospatial data and technologies in immunization programs and propose a process-based framework to guide decision-makers and planners in strengthening the management and use of geospatial data and geospatial technologies in immunization program in countries.	Provides information, steps and important considerations for the process of selecting, planning and budgeting geospatial data and technology applications for immunization.	Provide health officials with guidance on how to integrate geospatial data and technologies – in particular, geographic information systems (GIS) – into the microplanning process. The handbook also provides evidence on the benefits of geo-enabled microplanning
Target audience	All stakeholders interested in advocating for or investing in the management and use of geospatial data and technologies in immunization programs.	In country immunization programs willing to invest in the use of geospatial data and technology applications	Public health programme managers/ designers (country relevant staff, health officials at national and subnational level) and technical experts (GIS and other technical staff supporting microplanning efforts)
	Promotion	Resource mobilization	Technical implementation

Complementary while presenting some overlap

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Applicable to other health programmes and microplanning across all of them

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The HIS geo-enabling framework in the 3 guidelines

Guidance on the Use of Geospatial Data and Technologies in Immunization Programs



Rapid guidance for investment planning

Considerations for the geo-enabling environment

The long-term sustainability of these applications will depend on the availability of the necessary enabling environment. The elements that compose the enabling environment have been captured in the HIS geo-enabling framework developed by the Health GeoLab Collaborative [7] and used as reference by UNICEF when developing the geo-enabling framework for the immunisation programme as part of the 2018 UNICEF Guidance [2].







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Additional useful tools – Challenges addressed by applications of geospatial data and technologies



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Additional useful tools – Program specific supporting material

Guidance on the Use of Geospatial Data and Technologies in Immunization Programs



Element of eeo				MOH entities to	be involved in the	Recommended		
enabling framework	Benchmarks	Potential identified gap	Activities to fill the gap	HIS unit	Immunization	National	pilot project	
		The MCH has defined its vision, needs, strategy(ies) and plan but they have not yet been captured in official documents	Support the MOH with the development of such documents	x		x		
	1.1 The MOH has a vision, strategy(ve), and plans regarding the management and use of geospatial data and technologies 1.2 The vision, strategy and plan of the immunization program is aligned to the MOH one	The MOH has not yet defined/finalized its vision, strategy(ies) and/or action plan regarding the management and use of revisional data and technologies in health	Use the support of the immunization program to help the MOH with the definition and documentation of this vision, strategy[ies] and plan in concordance with the NSD if in oldere	x		×		
1. Vision, strategy(les) and plans		ha Interlutation pages has defined its: the Interlutation pages has defined its: the Interlutation pages has defined its and technologies but they ty peoplatic data and technologies but they stronggriss) and plan						
		The Immunization program has not yet defined its vision regarding the use of geospatial data and technologies	Support the immunization program with the development of such documents and ensure their alignment with MCH's		x		×	
2. Governance structure	2.1. The MOH has established a governance structure to handle issues pertaining to geography, geographical data management and geographic geographical data management 2.2. All the program, including immunication, as well as the development immunication, as well as the development partners using geopolial data and technologies, are involved in this structure 2.1 The ACOH is on beard of the National frontial Data Indexendent Monitorial Control Data Indexendent Monitorial Control Data Indexendence Monitorial Control Data In	The MOH has established a governance structure but not all the immunization stakeholders are not on board	Advocate for the immunization stakeholders to be on board of the established governance structure	x	x	x		
		The MOH has not yet established a governance structure to handle insues pertaining to the management of geospatial data and technologies	Use the support to the immunization program to support the establishment of such governance structure at the MOH level	x	x		×	
		The country does not yet have a NSDI	Use immunization as an example that could support the establishment of a NSDI in the country	x	x		×	
		A NSDI is in place but the MOH is not yet involved	Advocate for the MOH to be on board of the NSDI	x		×		

Strategies, stakeholders' involvement and implementation level to fill existing gaps

Appendix J. Generic Terms of Reference (TOR) for the position of geospatial data manager/GIS technician Redromd The Ministry of Health (Molt) has embarked in a process aiming at geo-enabling its Health information System (HS) in order for the all Ministry to share the same geography and therefore benefit from the visualization and analytical power that GIS technical for the difference that the MOH is looking for a data manager/GIS technical in order to be in the position to provide technical support in the areas of geospatial data management and GIS services during the geo- data management and GIS services in the with the guidelines, standard, and protocols identified/defined as part of the activities of the TWG on geospatial data management and GIS services. 3. Description of date! Working under the supervision of head of the MOH HIS unit and in close collaboration with the TWG Memierry, the incombert will be in charge of.	Appendix I. Item to activities Geografia data management Equipment/software	be consider when estimating the cost for the geospatial related listed in the work plan Insted in the work plan Insted in the work plan Insted in states of the costs • Begudar update of the material list for the geographic objects ore to public health and immutation and their accounted geographic • Begudar update of the material list. For the geographic objects ore to public health and immutation and their accounted geographic • Begudar update of the material list. • Colds maked device: • Colds maked device: • Liston matching the minimum requirements of the GIS software being used and hwing enough hard disk capacity to store geospatial data [1 T8 recommended are entergrane geospatial level on the for data and product • Special data or entergrane geospatial level hard to for data and product	Appendix G. Immunization program geo-enabling quick assessment form Quick immunization program geo-enabling assessment survey full itane of the instantion and Department
Providing geospatial data management and GI technical support to the Department of Public Health in a first plase and then to the entity MoV. Developing, maintaining, updating and sharing the master lists for the geographic objects core to public health (Health Aciditics, communiter), effettments and administrative divisions); Supporting the definition of guidelines, translards, and protocols aming at improving the availability, upility (completences, uniquenes), thinking, validity, accurate and consistency) and	Training on geospatial data management and/or technologies	torage when having several GS technicans. Women's to sever with a product internet connection with a god bandwidth. • Gujiment used during the training (GNSS enabled devices, laptop with the GS software) • God Internet access in case some web based tools and/or data are being used • Software)	regarding the "management and use of geocostal technologies to support its programs? Praises deviation going a support of the programs? The scion, needs, strategy and pick have been defined and are being captured in official goouniers (going, strategy, 90 m) The scion, needs, strategy and pick have been defined but
accessionity or geospata data; Supporting the implementation of the guidelines, standards, protocols and master lists in all the information system across the MoH; Generating (35 based data products to support decision making, 4. Expected deliverables Authoritative, standardized, complete, up-to-date and uniquely coded master lists of health	Field data collection	Piol study for resting data collection Field work junning and monitoring (with and surveys) Field data acquisition acrothware Salary for data collectors Gi de upper (training and supervision) Workingora and materials for training in field data collection	have not yet been aspluted in official coursens The srogram is in the process of defining its vision, needs, strategy and plan No vision, needs, strategy or plan have been betined yet Other (plasses specify)
 Includes, communities/settlements and administrative divisions in the country. Guidelines; standards and protocols endorsed by the TWG on geospatial data management and city. Guidelines; standards and protocols endorsed by the TWG on geospatial data management and city. How and the standards and protocols endorsed by the TWG on geospatial data management and city. How and the standards and protocols apport of the stabilished SOP. How and the stabilished software and maps apport the stabilished SOP and on the stabilished SOP. How and the stabilished software and protocol and the management and/or Gio or enough professional experience in data management and/or file or enough professional experience in data management and/or file or enough professional experience and protocol and the management and/or file or enough professional experience and protocol and the management and/or file or enough professional experience works and the stabilized or other Gio Software as well as MS Office suite. Ability work harmonlough spatial of a team. How the more of ArcNiew, ArcGio or other Gio Software as well as MS Office suite. Ability work harmonlough spatial of a team. How the and convoluting in a Gio related protect: Housing and approxees of Fublic Health would be seen as an advantage: Housing anguage: Proficient Brighth would be seen as an advantage. 	Data estraction	 Arrices of satellite images or topographic med. Working time to digitae features from base maps (satellite images, topographic maps) 	Instant Instant

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Terms of reference

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Items for consideration when estimating costing

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Quick assessment tool

Can be contextualized to be applicable to any health program





Additional useful tools - Cost and timeline drivers for activities aimed at strengthening the geo-enabling environment

Rapid guidance for investment planning

<form> Marken der der der der der der der der der der</form>	Master lists and common geo-registry							DISIDERATIONS FOR THE GEO-ENABLING ENVIRONMENT			CONSIDERATIONS FOR THE GEO-ENABLING ENVIRONMENT	
<form></form>	dain triggers that will be conducive of the activities in this area:	Main hudget considerations	COSTAND	TIMELINE DRIVERS FOR ACTIVITIES AIMED AT STRENGT	THENING THE GEO	-ENABLING		COST AND TIMELINE DRIVERS FOR ACTIVITIES AIMED AT STRENGTHENIN ENVIRONMENT	IG THE GEO-EN/	ABLING	COST AND TIMELINE DRIVERS FOR ACTIVITIES AIMED AT STRENGTHE ENVIRONMENT	ENING THE GEO-ENABLING
<text></text>	.1-5.2 The immunisation programme plans to use geospatial data and echnologies as part of the intervention.	 Scale of implementation (staff, equipment, training) 	Vision, str	ategy and plans				Technical capacity			Policy	
<text><text><text><text></text></text></text></text>	3.3-5.4 There is a need to maintain and regularly update the Master ists of aposition approaches philote to sustain aposition applications of	Data quality of existing datasets' Amount of travel and meetings	Main trians	re that will be conducive of the activities in this area:	Main hudes	at considerations	N	fain triggers that will be conducive of the activities in this area:	Main budget co	onsiderations		
<form><form><form><form><form><form><form><form><form><form><form><form></form></form></form></form></form></form></form></form></form></form></form></form>	peospatial data and technologies.	required	1.1 The imp	ortance of geospatial data and technologies is recognise	d • Amoun		3	 I he use of geospatial data and technologies has reached a level ithin the health sector that would benefit from a central level geospatial 	 Existing tech Amount 	nical capacity gaps	Main triggers that will be conducive of the activities in this area: 8.1 A central level geospatial data management unit has been estab-	Main budget considerations Number of stakeholders needed t
<text><text><text><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></text></text></text>	5.5 There is a willingness to ensure consistency across all the infor-	 Consultancy (field work training, 			d require		d	ata management unit.	training		lished, with specification, standards and protocols released and Master	be involved
<text><text><text><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></text></text></text>	nation systems used by the health sector.	data collection, management and			ir • Transla		3	.2 The intervention that is being implemented by the immunisation	 Gaps in and cur 		Lists have been created. 8.2. The immunisation programme is not yet complying to the policy.	Amount of travel and meeting
<form><form><form><form><form><form> M. S. S.</form></form></form></form></form></form>	Benchmarks (i.e. the situation to be ultimately achieved for a sus-	analysis) for data collection for		5	training	CONSIDERATIONS FOR T	t oro read	se within the MOH or accessible to the MOH (e.g. through external	 Scale a 		that has been released.	Translation required
<text><text><text><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item><list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></list-item></text></text></text>	ainable use of geospatial data and technologies in the immunisation programme):	sider costs such as visits for field	HE GEO-ENABLING ENVIRONMENT		 Shops, i Fee of i 	CONSIDERATIONS FOR TI	HE GEO-ENAL	artnerships with technical institutes, Universities, NGOs, centres of	needed	CONSIDERATIONS FOR THE GEO-ENABL	Prochasely (in the situation to be objected as the set	 A consultant with expertise in development
<form> mark and mark an</form>	.1 The types of geographic objects (e.g. health facilities, administra-	work, planning and monitoring,			experti			se of geospatial data management and technologies.	 Ongoin 		tainable use of geospatial data and technologies in the immunisation	agement and use of geospatial dat
<text><text><text></text></text></text>	ive divisions, health areas, villages) needed by the immunisation pro- tramme for the implementation of its interventions have been identified	 purchase of field data collection equipment 	VERS FOR A CTIVITIES AIMED AT STRENGT	HENING THE GEO-ENABLING	s- geospa n in healt	COST AND TIMELINE DRI	VERS FOR ACT	and an all the standard sectors and a standard sector and the standard sector is the	GIS tec	COST AND TIMELINE DRIVERS FOR ACTIV	programme):	and technologies in health system
<form> M. M. M</form>	.2 The immunisation programme has access to a Master List ² for each	 Salary/per-diems for field data 			Existin	Construction		se of geospatial data and technologies in the immunisation programme):	 Cost of 	ENVIRONMENT	over the guardianship on geospatial data specifications, standards	
<form> main and main and ma</form>	peographic object they need to cover.	collectors Workshops and materials for train	idards and protocols		- policies	Governance structure	3	1 The MOH has a central level geospatial data management unit with	nical in	Availability of geospatial technologies	and protocols as well as over the development, maintenance, update	
<form> 4. Substant and the stant and the</form>	partners through a common geo-registry.	ing in field data collection	conducive of the activities in this area:	Main budget considerations	p-	Main triggers that will be o	conducive of t	nough technical capacity to: a) ensure guardianship over the defined uidelines, standards and protocols: b) support the development, mainte-	 agencie Training 	Main triggers that will be conducive of the	and sharing of Master Lists for the geographic objects core to public health through the use of a common geo-registry; b) the use of the	
<form> A. A. A</form>	5.4 An updating mechanism is in place and the Master Lists are reg- dealer updated.	For eachlighteen of the undering	chnologies has been recognised within the	be involved during the consultation	8.	2.1 There is a need to discu the quality of generatical d	uss and agree u	ance, regular update and sharing of the Master Lists for the geographic	stationa	6.1 The central level geospatial data man	developed guidelines, standards, protocols and Master Lists by all the	
<form> and and angend and a description of a descr</form>	5.5 All the above Master Lists, and especially their officially recognised	mechanism, platform and regular up-	with regards to the application of geospatia	 Amount of travel and meetings 		technologies within the he	alth sector.	bjects core to public health and immunisation; c) support the imple-	 Equipm (Global) 	unit has been established and need to be	stakeholders in the health sector. 8.2 The immunisation programme is complying with this policy	
<form>Markamend</form>	odes, are being integrated into all the information systems and used	date of Master Lists consider costs:	e costed. es exist or is in the process of being estab-	Translation if required		2.2 The issues that need to	o be addressed	ealth programmes and information systems; d) provide GIS services to	(GNSS)	quiring the use of geospatial technologie	e.e The initialization programme is complying that this policy.	_
<form> A marked marked</form>	during data collection, reporting and monitoring across all programmes including immunisation (in the immunisation registry, for example).	 field visits for data collection maintenance of field data collec- 		 Fee of consultant with expertise on 		2.3 A National Spatial Data	Infrastructure 7	IIS units and beyond, as needed.	with the	GIS software).	Anticipated potential activities to achieve benchmarks (Single cost/	
 manumentan manumentan manuman manumentan manumentan manumentan manumentan manumentan m		tion equipment		the identification or adaptation of health-related geospatial data and	is .	or is in the process of bein	ig established p	acity and expertise for immunisation specific geospatial data collection,	tools or	Benchmarks (i.e. the situation to be ultim	 Advocacy with the MOH for the development of the policy (single 	
<form> inversion de de</form>	Inticipated potential activities to achieve benchmarks (Single cost/ ecurrent cost):	 situational assessment for feasibil- ity of implementing a Master List 	tion to be ultimately achieved for the sus-	technologies specification, stan-	e h	Benchmarks (i.e. the situa	etion to be ulti	xtraction, management, analysis, and visualisation.	Venues	tainable use of geospatial data and technologic	cost)	
 min or provide and many many many many many many many many	Identification of the type of geographic objects needed by the immu-	management platform	data and technologies in the immunisation	dards and protocols to support the application of geospatial data and		tainable use of geospatial	data and tech A	nticipated potential activities to achieve benchmarks (Single cost/	 facilitat 	6.1 The central level geospatial data manage	 Implementation of the policy including the alignment of the im- 	
Building and game and and game and	nisation programme and for which Master Lists would be required to support the application of accornatial data and technologies (single cost)	 consultancy to guide implementa- tion activities of Master List man- 	andards and protocols have been defined	technologies	d	2.1 The MOH has establish	Fed a covernar	ecurrent cost):	Training	has access to the necessary geospatial te	munisation programmes strategic and planning documents to the	
 and net rubba net rubba	Development and agreement on standards for Master List content	agement platform	used across all the programmes, including		-	pertaining to geography, g	eospatial data	Organisation of trainings on geospatial data collection, extraction, management, analysis, or visualisation for health staff involved in	 Iranspo 	devices, GIS software) to support its man 6.2 The immunisation programme has ac	 Implementation of the policy 	
Markade discussion Address discusis Address discussion Address d	and structure (single cost)	 cost of hosting and maintenance of the Mester List menanement plat 	standards followed by the MOH are aligned		٦,	technologies.	rammas inclus	the application of geospatial data and technologies (as required by		spatial technology to support its activities	 Evaluation of the level of implementation of the policy (recurrent) 	
if part, which and part of part, which are part of part	ter Lists and according to the identified standards and identification	form (staff, equipment including	National Spatial Data Infrastructure (NSDI)			the MOH development par	tners using ged	specific application) (Recurrent) Organisation of initial and refresher trainings for data manager/GIS		Anticipated potential activities to achieve	Main timeline drivers	-
 • in statistical, stat	of gaps, including gathering of existing datasets and stakeholder	platform server hosting cost)	vities to achieve benchmarks (Single cos	1/		are involved in this structu	ire	technicians at central level geospatial data management units (if		Recurrent cost):	 Level of commitment and support of the managerial level 	
indication of the damageneric latter is the damageneric latte damageneris damageneric latter is the damageneric latter is the	Data collection, including digitisation for completion of Master Lists					2.3 The MOH is on the bo	bard of the No	one is established, or else the personnel with a mandate over geo-		 Purchase and maintenance of GNSS en purchase of leptons for staff implied in a 	 Presence of a local champion in the health sector Level of collaboration and coordination in the health sector 	
 Multicular default of the management to segment on higher of the management to segment on higher of the management to segment to higher of the management to segm	(Single cost)		and protocols (workshops) (Single cost)	ta		 Anticipated potential ac 	tivities to achie	unit) (Recurrent)		analysis and visualisation (recurrent)	Existence of cross-sector policies	
 by by manufal Marrie La manggeent platform congulat build point of bounds, manggeent platform congulation build point platform co	Establishment of the updating mechanism and regular update of Master Lists (recurrent)		ort to programmes to implement the defin	be		 Organisation of activitie 	s (meetings/wa	Participation of data manager/GIS technician to conference/events		 Purchase of separated large screen and 		1
including disadded for forming integrated and darking of Ma- integrate disadded for forming integrated and darking of Ma- integrated disadded for forming integrated disadded integrated and darking of Ma- integrated disadded integrated disadded and darking of Ma- integrated disadded and maline of Ma- integrated disadded integrated disadded integrated disadded and darking of Ma- integrated disadded and maline of Ma- integrated disadded disa	Deployment of a Master List management platform compliant with		and protocols (recurrent)		n	ation and participation i	n the governar	Establishment of partnerships to source technical capacity or training		geospatial server solution for data and p		
disport of the many set wild in low or you and workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many set wild in galaxies in a workyin or the governance at many	recognised standards for hosting, management and sharing of Mas- ter Lists (recurrent)					working group, commit Consultancy to support	tee or similar) the creation of	support for the MOH (e.g., technical institutes, Universities, NGOs,		several GIS technicians (recurrent)		
			trategy/plan formulation cycle			and workplan of the gov	vernance struc	Centres of Excellence of other national agencies) (recurrent)		 when it applies, purchase of GIS software based) for data management, analysis a 		
Mester (Liste data and to be Mid. Non-Matabale of an opplication and coordination between the MOH and opplication and coordination and coordination and coordination and coordination between the MOH and opplication and coordination between the MOH and opplication and coordination an	Main timeline drivers Extended identification of gens in data quality and availability for the		curity context			group, committee or sin	nilar), and orga N	fain timeline drivers		 Establishment of Internet connection 		
Availability of an operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform box, maintain and regulary update the Mattern and operational platform the functional operational platform the functional operational platform the subscholder analytic constraint transport operatio	Master Lists that need to be filled		iorities			 Convening regular meet 	ings of the gov	Existing technical capacity and skills within the MOH Conducive MOH organisational structure (natural host for the central		staff involved in geospatial data gather and visualisation (recurrent)		
Level of collaboration and coordination between the MOH and on- genitation in objects that might not be used the masked of the MOH (e.g. ed. ministrative divious, village) Main is imaline diview in application in division of googettid did and technol. Subscioler relation of the MOH (e.g. ed. ministrative division, village) Name is imaline diview in application in division of googettid did and technol. Subscioler relation of the MOH (e.g. ed. ministrative division, village) Name is imaline diview in application in the hole is include diview in application in the hole is include division division in the hole is include division division in the hole is include division d	Availability of an operational platform to host, maintain and regularly		neetings required for buy-in, coordination			 Nominated MOH focal p 	oint to attend t	level geospatial data management units)		 purchase and maintenance of printers for 		
genitation in charge of maintaneous of the datasets of the dat	Level of collaboration and coordination between the MOH and or-					Main timeline drivers		Specific timeline of the application of geospatial data and technol- ogies to be supported		Main timeline drivers		
	ganisations in charge of maintenance of the datasets of geographic					Level of commitment an	nd support in e	In-country presence of capacity building institutions (e.g. Universities)		 Current level of technical capacities an 		
	ministrative divisions, villages)					 Presence of a local chail Stakeholder availability 	mpion in the n	Availability of the staff to be trained		nologies that are needed Efficiency of procurement and distribution		
	Delays in field data collection due to weather, social or political					 Level of trust among str 	akeholders			to large numbers of equipment		
	instability				MMES / 2021	 Urgency to address con Presence of an operation 	nmon issues onal NSDI	TRACING OF OPPORTUNE TRAINING OF ITS AND DATE TO PERSONNEL INVESTIGATION RECORD AND F.			I PURPLAINS STORATIAL TROUNSI SSIFE AND BATS TO STRENTLINE INFORMATION PROCESSION	

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GEOLAB Hub



MORU Epidemiology



Additional useful tools – Health GeoLab's free resources

Guidance to improve the management and use of geospatial data and technologies in health



Tropical Health Network





Covers most of the geospatial data management cycle

unicef 🥴

MORU Epidemiology



Includes material to practice the collection of geographic coordinates in the field and the creation of thematic maps

HEALTH

GEOLAB Hub

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OXFORD

All of this is freely available from HGL's web site





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HEALTH GEOLAB Hub Tropical Health Network

Regional resource supporting countries in Asia and the Pacific with the geo-enablement of their Health Information Systems (HIS)

More effective management and use of geospatial data and technologies to support decision making for health



Pacific Island Countrie

36

15

16

22

19. Nepal

20. Pakista

23 Philippines

Republic c
 Samoa

27. Sri Lanka

26. Solomon Islands

Papua New Guinea
 People's Republic of Chin

Countries

Bhutan

India

Ranoladest

I. Cambodia

10 Indonesia

. Democratic People's Republic of Korea

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HIS Geo-Enabling Framework