Expert Consultation and Meeting on Enhancing Geospatial Information Management Arrangements and Accelerating Implementation of the Sustainable Development Goals, and the Sub-regional Workshop on the United Nations Integrated Geospatial Information Framework (UN-IGIF) for Central Asia, South Asia, and neighboring countries
Implementing geospatial strategies: challenges and opportunities

The Health GeoLab: A regional resource to support the geo-enablement of the health sector in countries

Dr Steeve Ebener (MORU/ Health GeoLab)

The geography of Public Health

"All organized measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole."[1]

The three main functions of public health are:

- **Risk assessment** - The assessment and monitoring of the health of communities and populations at risk to identify health problems and priorities
- **Assurance of services** – To ensure that all populations have access to quality, timely, and cost-effective care
- **Policy development** - The formulation of public health policies designed to solve identified health problems and priorities

There is a strong geographic dimension to each of these functions

1 http://www.euro.who.int/__data/assets/pdf_file/0007/152683/e95877.pdf

A geo-enabled health information system (HIS)

An Information System that fully benefits from the power of **geography**, **geospatial data** and **geospatial technologies** through the proper integration of the **geographic** and **time** dimensions across its business processes

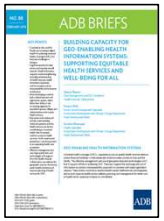
- Can you think about one piece of data or information within an HIS that has neither a geographic nor a time dimension?

" Everything happens somewhere at a given time"

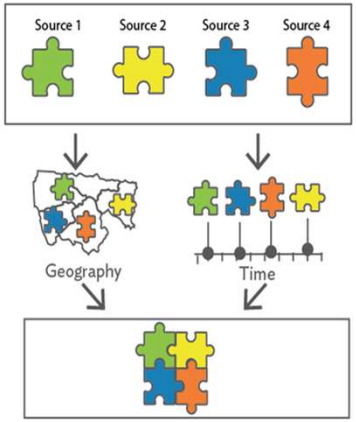
- Properly integrating geography and time in the HIS improves geographically-based decision making and provides a more systemic and systematic approach to solving public health problems.
- Directly applicable to any public health program or intervention

Benefits of a proper integration of the geographical and temporal dimensions in the HIS, a program or an intervention

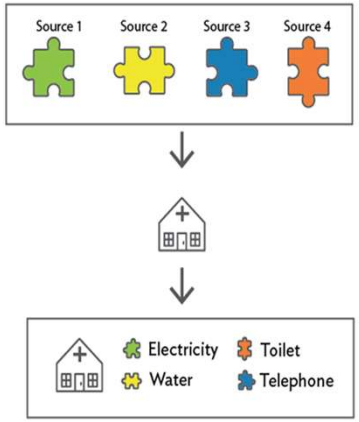
1



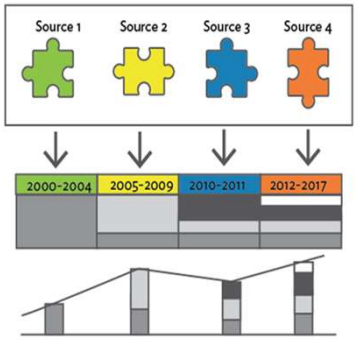
1 Contextualize data from different sources in both space and time



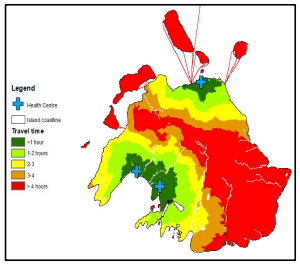
2 Use geographic features (i.e. health facilities) as the common link between data collected by different sources

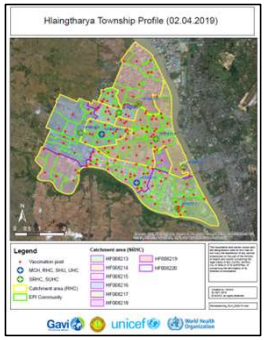


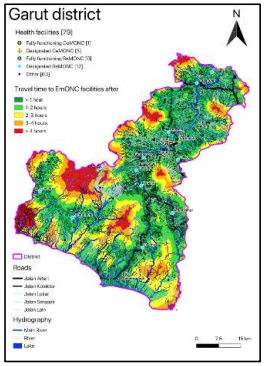
3 Facilitate trend analysis by taking into account how geography is evolving through time

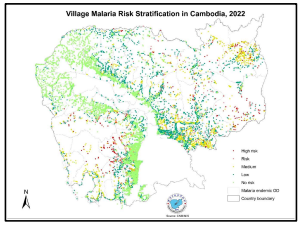


4 Use a geographic information system (GIS) to create thematic maps, conduct spatial analyses, or apply spatially distributed models









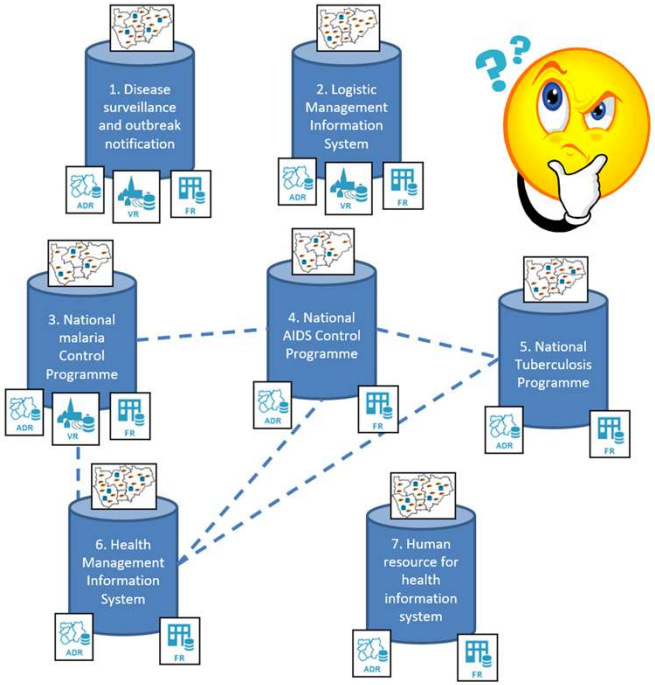
➡ How do you benefit from this in a sustainable way?

➡ By geo-enabling the health information system, programs or interventions

[1] https://www.adb.org/publications/building-capacity-geo-enabling-health-information-systems

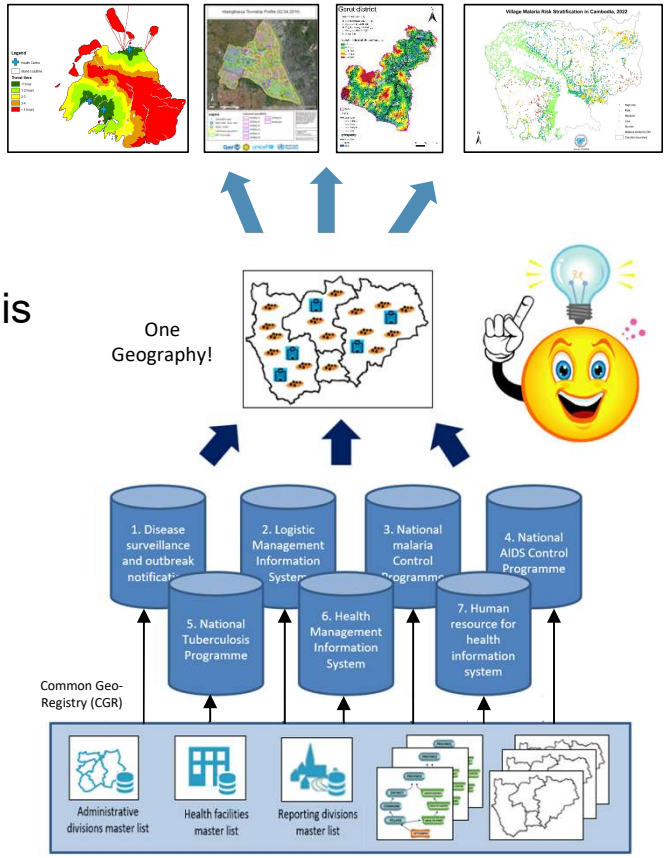
The vision behind the geo-enablement of the HIS

Passing from this …



Each information system maintains and uses a different geography which is not cost-effective and does not allow benefiting from the power of geography, geospatial data and technologies

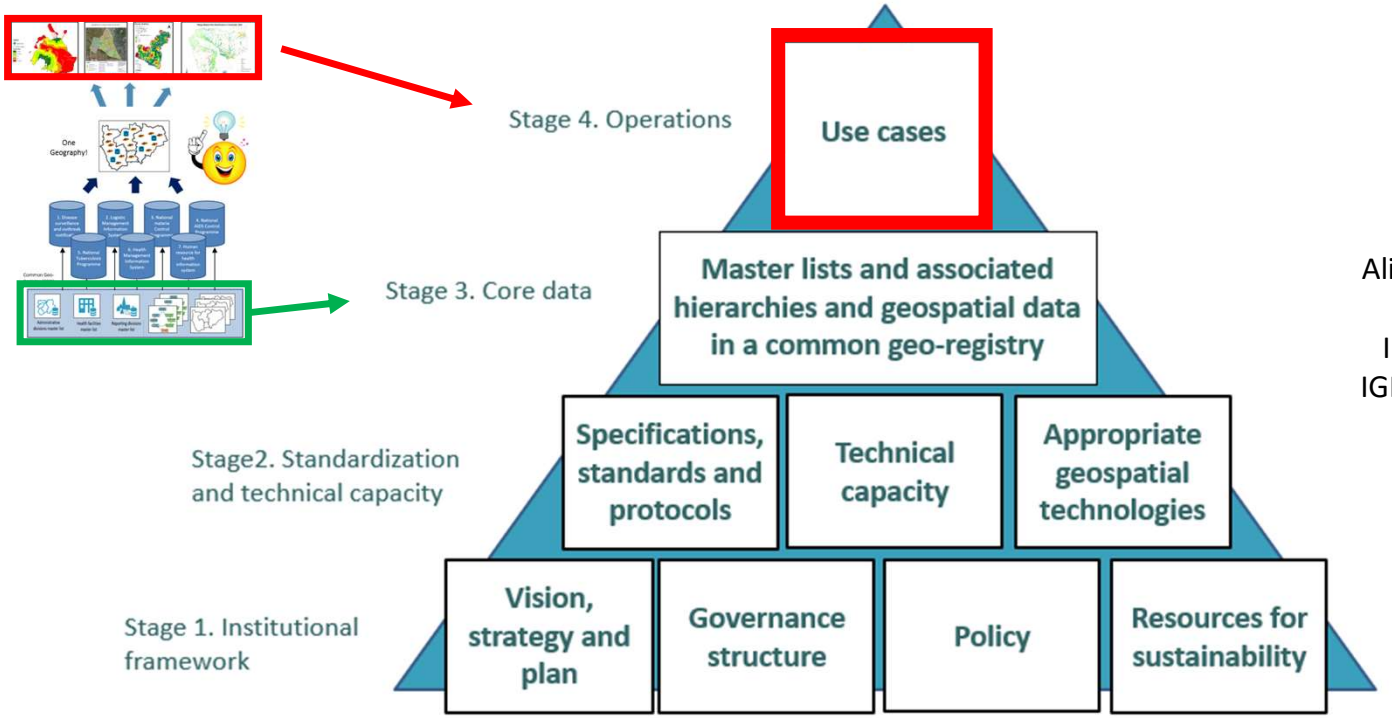
… to this



All information systems use the same geography over time, which not only reduces duplication of effort and costs, but also takes full advantage of the power of geography, geospatial data and technologies

The HIS geo-enabling framework

9 elements that must be in place and sustained over the long term for a HIS, a program or an intervention to be considered geo-enabled

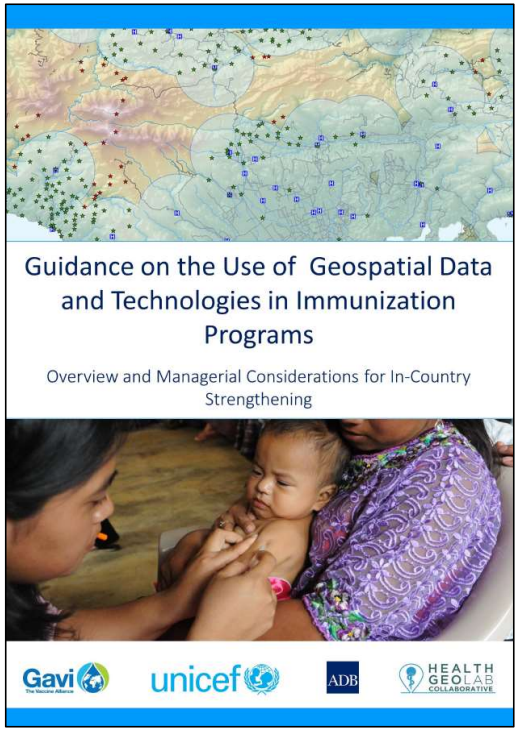


Aligned with the United Nations Integrated Geospatial Information Framework (UN-IGIF) – Cross sectoral framework

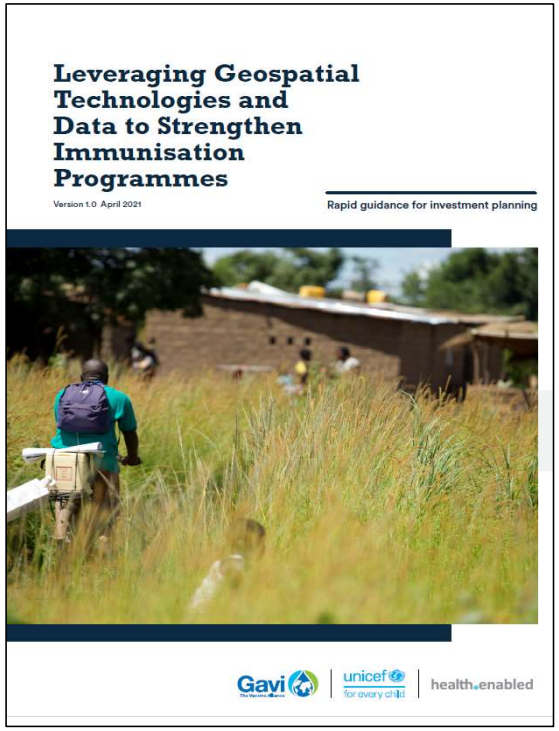
Each stage supports the next one towards an operational use of geography, geospatial data and technologies to support the implementation of health programs

Guidelines including/based on the HIS geo-enabling framework

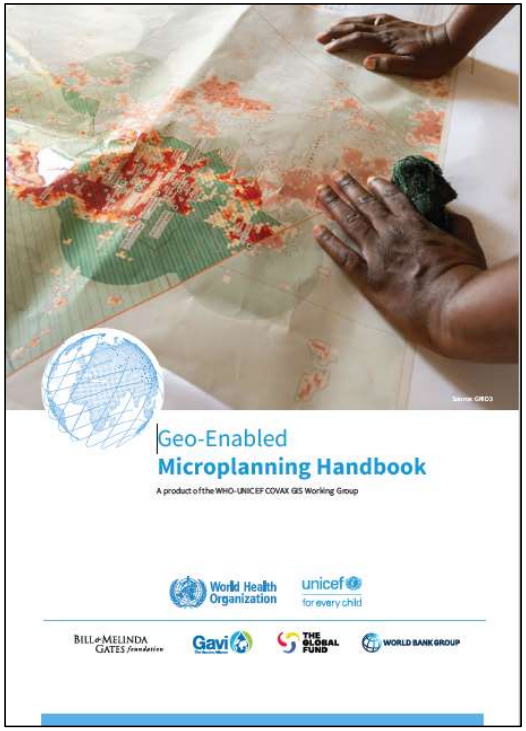
2018



2021



2023



➡ Framework used by UNICEF, GAVI, WHO, the Global Fund and UNFPA to support the management and use of geospatial data and technologies in countries.

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 – Objectives and benchmarks

Element of the framework	Objective	Benchmarks
1. Vision, strategy, and action plan	A vision, a strategy and an action plan have been defined and are implemented to support the geo-enablement of the HIS	1.1 The MOH has a vision, strategy, and plans regarding the management and use of geospatial data and technologies. 1.2 Each key program has a vision, strategy and action plan regarding the management and use of
2. Governance structure 3. Technical capacity 4. Data specifications, standards and protocols	5. Master lists and common geo-registry	The Ministry of Health has quality master lists and associated GIS layers for the geographic objects key to public health	5.1. The MOH has a complete, up-to-date, uniquely coded, and geo-referenced (for point type objects) master list for each geographic object key to public health (health facilities, administrative divisions and villages, reporting divisions. 5.2. The government maintains, regularly updates, and share shapefiles containing the boundaries of the administrative and health reporting divisions. 5.3 These master lists and associated spatial data are simultaneously hosted, maintained, regularly updated, and shared using a Common Geo-Registry. 5.4. All the master lists, and especially their officially recognized codes, are being integrated in all the information systems and used for data collection, reporting, and monitoring across all health programs.
	6. Appropriate geospatial technologies	The central unit of the Ministry of Health as well as the main health programs have access to the necessary and appropriate geospatial technologies	6.1. The central level geospatial data management and technologies unit has access to the necessary and appropriate geospatial technologies (GNSS, GIS) to support its mandate. 6.2 The key health programs have access to the necessary and appropriate geospatial technologies (GNSS, GIS) to support the implementation of their activities
	7. Documented use cases	The benefits of managing and using geospatial data and technologies are recognized by all programs and use cases demonstrating this are documented	7.1. Geospatial data and technologies are recognized as important and their full potential is being used to support the implementation of key health programs towards reaching SDG 3. 7.2 Use cases supporting decision making and/or planning are documented and available.
	8. Policies supporting the geo-enabling process	The necessary policies to support the geo-enablement of the Health Information System have been defined and are being applied	8.1. A policy/Policies enforcing the following has/have been released: a) The mandate over the guardianship on geospatial data specifications, standards, and protocols as well as over the development, maintenance, update, and sharing of master lists for the geographic objects core to public health using a common geo-registry. b) The use of the developed specifications, standards, protocols, and master lists by all the stakeholders in the health sector.
	9. Resource for sustainability	The financial resources necessary to ensure the sustainability of geo-enablement exist in the long term	9.1. The central level geospatial data management and technologies unit has the necessary financial resources to ensure the long-term sustainability of its activities linked to the geo-enablement of the HIS. 9.2 The key health programs have the necessary financial resources to ensure the long-term sustainability of their activities

1

Used to assess the current level of geo-enablement in each country and as the basis for developing the action plan to fill existing gaps

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

The HIS geo-enabling framework – Objectives and benchmarks

2. Governance structure	A governance structure supporting the vision, strategy and action plan has been established and is operational	2.1. The MOH has established a governance structure to handle issues pertaining to the management and use of geospatial data and technologies. 2.2. All the health program and the stakeholders involved in the management and use of geospatial data and technologies in health are part of the governance structure. 2.3 The MOH is on board of the National Spatial Data Infrastructure (NSDI).
4. Specifications, standards and protocols	All programs use the same data specifications, standards and protocols to ensure geospatial data quality	4.1. The NSDI has defined the geospatial data and technologies related specifications, standards and protocols that should be used by all governmental agencies. 4.2. The MOH is using the geospatial data and technologies related specifications, standards and protocols across all key health programs.

- Prepare the health sector to be involved in the NSDI
- Promote for health to be one of the drivers of the NSDI process and therefore of the IGIF implementation

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

The HIS geo-enabling framework - Origin

1

Situation in countries of the Asia-Pacific region (2017)

Géo-enabling components	BGD	BTN	KHM	FJI	IND	IDN	LAO	MMR	MYS	NPL	PHL	LKA	VNM
1. Vision, needs, stratégy and plan													
2a. Governance structure													
2b. GIS technical capacity													
3. Data specifications, standards and protocols													
4. Master list													
5. GIS technology													
6. Map production (use)													
7. Policy													
8. Resources for sustainability													

Existing In process Not existing

Has received a GIS training (mainly in data collection and thematic mapping)

Has access to a GIS software

Generates thematic maps, but spatial analysis and modelling are very limited

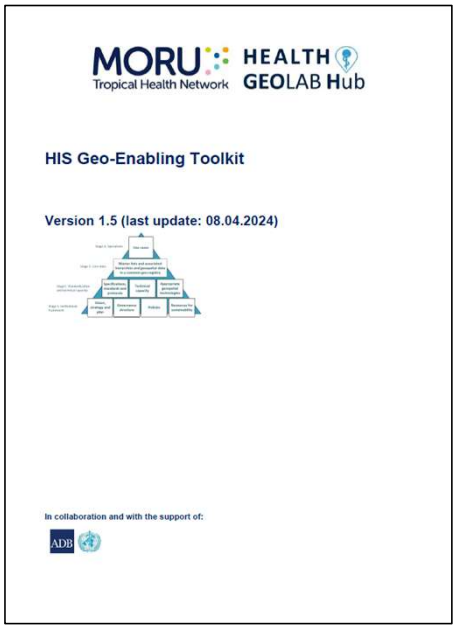
BGD = Bangladesh, BTN = Bhutan, KHM = Cambodia, FJI = Fiji, IND = Inde, IDN = Indonésia, LAO = République Démocratique Populaire du Lao, MMR = Myanmar, MYS = Malaysie, NPL = Népal, PHL = Philippines, LKA = Sri Lanka, VNM = Viet Nam.

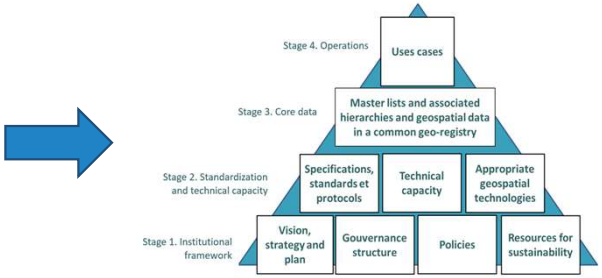
Important gaps for the elements guaranteeing the quality, effectiveness and long-term sustainability of data and information products

[1] https://www.adb.org/publications/building-capacity-geo-enabling-health-information-systems

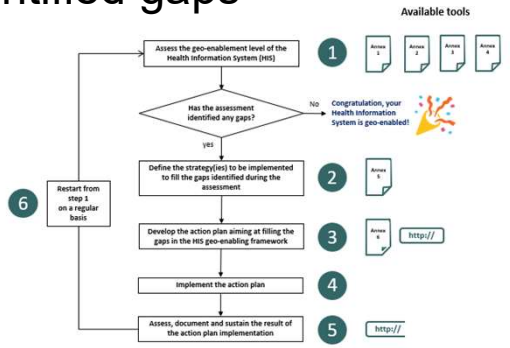
The HIS Geo-enabling toolkit

Designed to help the health sector in countries to assess their level of geo-enablement of their HIS and develop the action plan aimed at filling the identified gaps

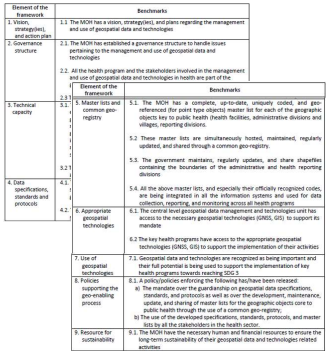




HIS geo-enabling framework pyramid

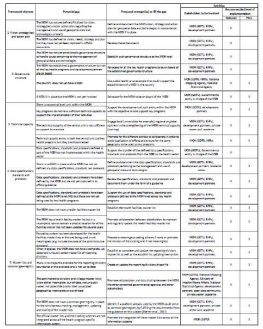


Implementation process and associated materials

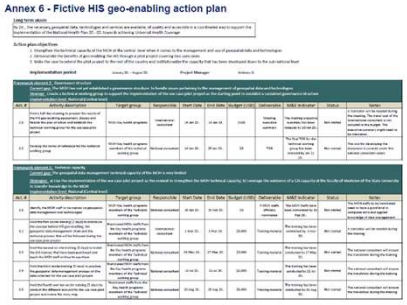


Benchmarks

HIS Geo-enabling quick assessment questionnaire



Strategies, stakeholder engagement and level of implementation to address existing gaps



Action plan template

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

HIS Geo-enabling framework implementation process

To achieve the benchmarks of the HIS geo-enabling framework, it is necessary to follow a six-step process described in the HIS geo-enabling toolkit:

Step 1 : Assess the level of geo-enablement of the health information system

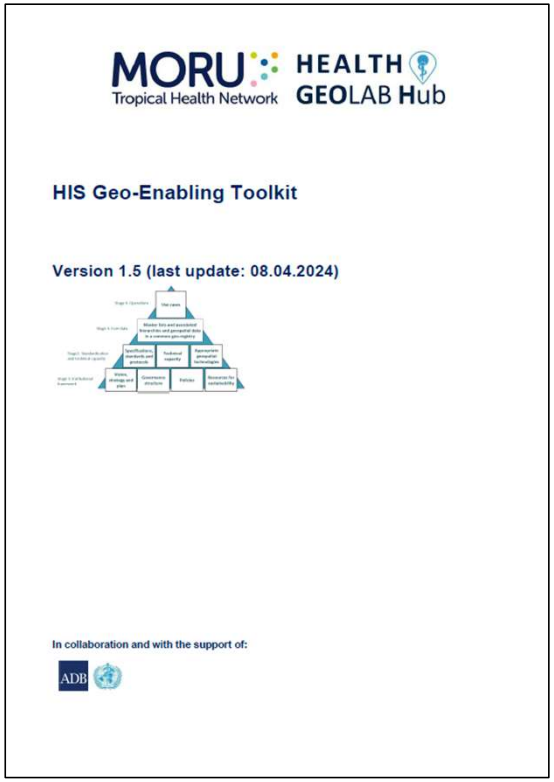
Step 2 : Define the strategy(ies) to be implemented to fill the gaps identified during the assessment

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

Step 4 : Implement the action plan

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

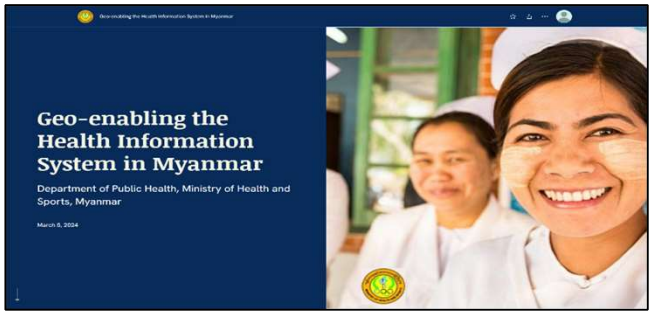
Step 6 : Restart from step 1 on a regular basis



➡ Very similar to the IGIF CAP process

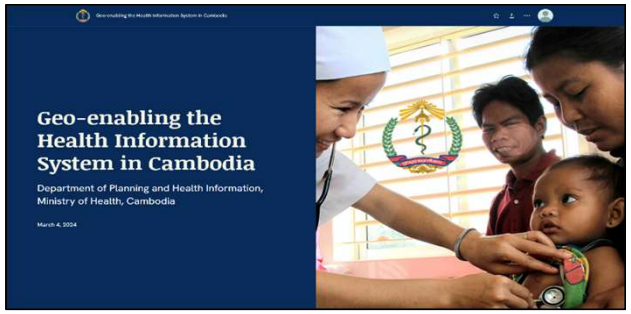
http://www.healthgeolab.net/DOCUMENTS/HIS_geo-enabling_toolkit.pdf

Example of in-country implementation



Myanmar
(https://arcg.is/OCHOz)

Cambodia
(https://arcg.is/0uviGj)



Viet Nam
(https://arcg.is/1XmLjy)

Mongolia
(https://arcg.is/1O0u4r)

HEALTH GEOLAB Hub

MORU Tropical Health Network

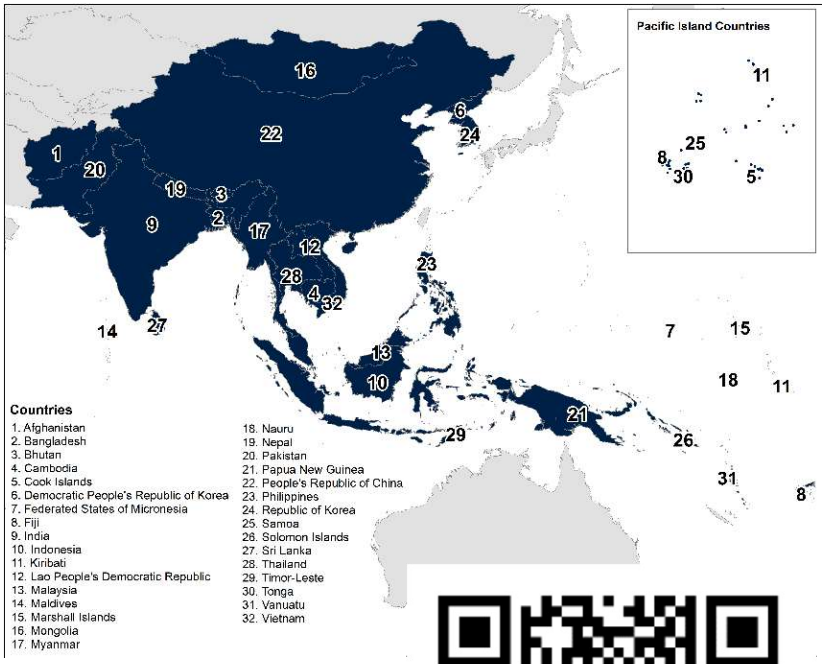
Regional resource supporting countries in Asia and the Pacific with the geo-enablement of their Health Information Systems (HIS)

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

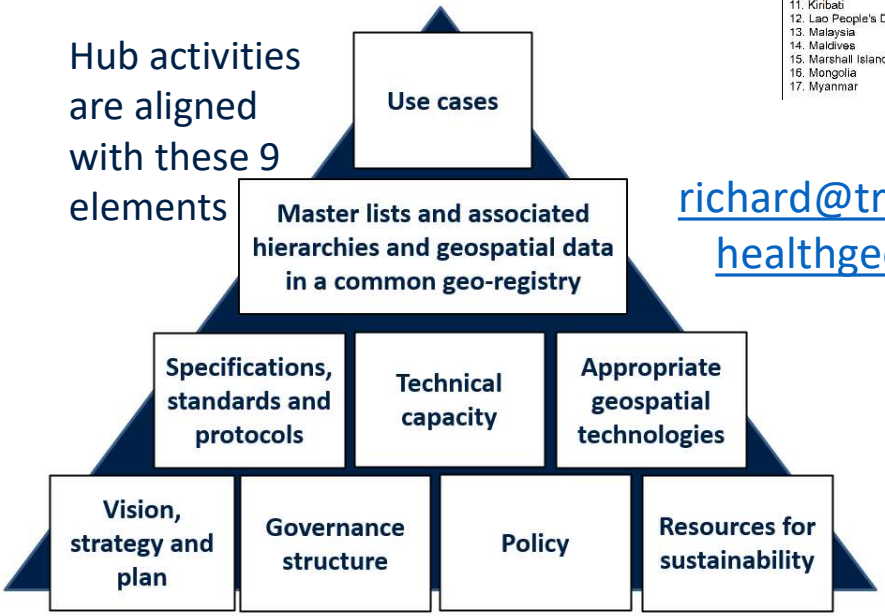
1. **Research**
2. **Technical assistance**
3. **Training**

Support for collection, management and analysis of geospatial data

Develop, validate and apply robust methods and tools



Hub activities are aligned with these 9 elements



HIS Geo-Enabling Framework

richard@tropmedres.ac
healthgeolab.net/hub

wellcome

UNIVERSITY OF OXFORD

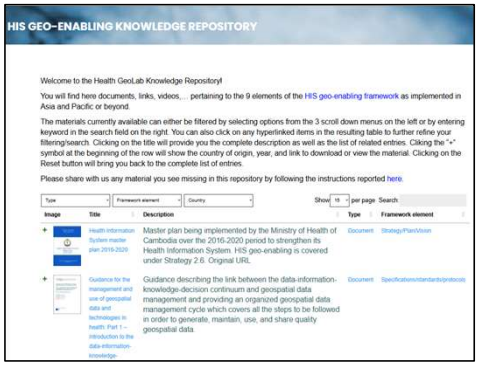
Free resources accessible from Health GeoLab's web site

https://healthgeolab.net/hub/

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

Covers all the components of the geospatial data management cycle

Knowledge repository



Organized according to the 9 elements of the HIS geo-enabling framework

Training material

Includes practical exercises (field data collection, thematic mapping,…

Dr Steeve Ebener
PhD

Health GeoLab coordinator and technical assistance lead

Epidemiology Department
Mahidol-Oxford Tropical Medicine Research Unit (MORU)
Faculty of Tropical Medicine
Mahidol University, Bangkok, Thailand

Email: steeve@tropmedres.ac
Cell: +63 927 0142 991

Thank you!