

USER MANUAL

SRI LANKA: GIS BASED HEALTH MAPPING SYSTEM

This manual is intended for the use of the Health Teams of the Ministry of Health and Indigenous Medicine (MOHNIM) and the Provincial and Regional Health Departments of Sri Lanka. The manual serves as a step-by-step guide to utilizing Geographical Information System (GIS) based tools for health planning and management.



Ministry of Health, Nutrition
& Indigenous Medicine



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1. HEALTHMAP SYSTEM

1.1 Introduction

HEALTHMAP is a web application that has been developed to map the health care institutions in Sri Lanka at the District and Provincial levels. But its functionalities are not limited to mapping health institutions as it can be used to map any location based parameters such as populations with risk factors, diseases, polluted areas, etc.

This web application has been designed as a “responsive” web application that can adjust its views and functionalities to match the device (i.e. Desktop computer, tab or smartphone) that you are accessing the web application.

The application will facilitate you to take a photograph of the institution and upload it to the GIS map based system with your smartphone. The desktop version will have facility to add a photo taken using an ordinary camera and add location coordinates and upload to the GIS map.

This document provides a step-by-step guide for the users of HEALTHMAP to map the health institutions in a variety of situations such as locations with no mobile phone signals, phones without GPS facilities, etc. The system has been tested with Android and Windows phones. For Apple phones some functionalities may not work.

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1.2. ACCESSING HEALTHMAP

Since HEALTHMAP (earlier referred to as HIMAPSL) is a responsive web application, enter <http://52.163.248.76/HEALTHMAP/HOME> in the URL space of your device irrespective of the device being a Desktop, Tab or a Smartphone.

Supported Browsers

The smartphone version of HEALTHMAP application is most compatible with Google Chrome Browser. This is the default browser for the Android phones. If you have a different browser, you can download by searching the web site “Download Chrome for Android”.

First time users can set up a login name and password using the ‘Register as a new user’ option. If you have already completed the registration process, you can log in using your existing login name and password.

Accessing HEALTHMAP via smartphone or a Tab

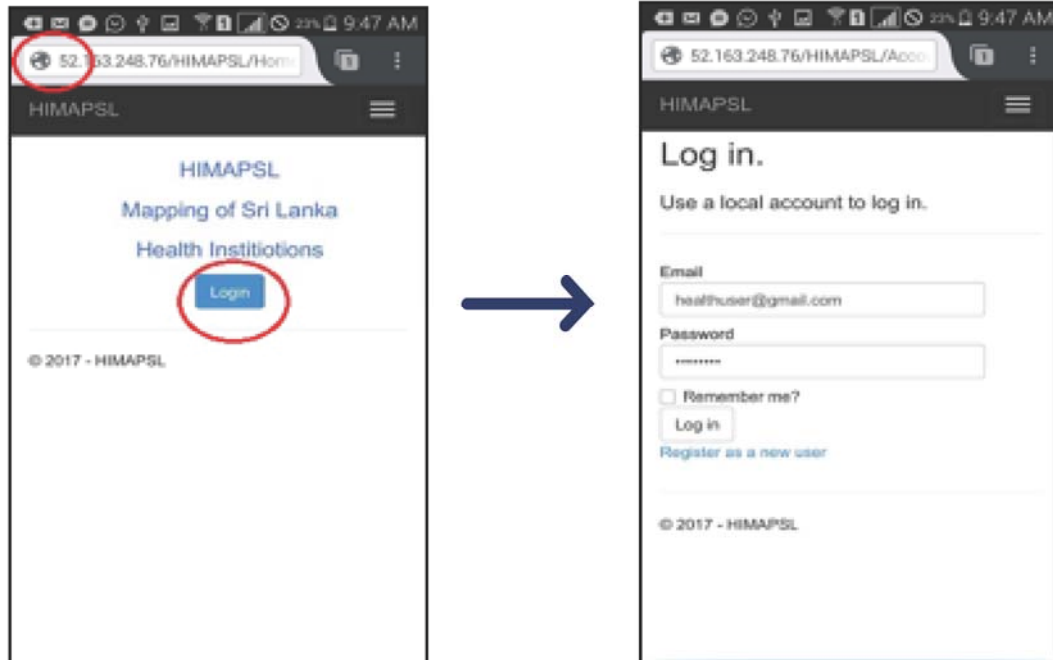
If you are accessing the web site using a smartphone, the functionalities such as taking a photo and uploading it to the GIS map and entering institutional ID code, etc will be present.

Accessing HEALTHMAP via a Desktop

If you are accessing the web site using a desktop, functionalities such as uploading a photo taken from a camera to the location of the health institution, moving incorrectly located institutions to the correct locations, etc will be available.

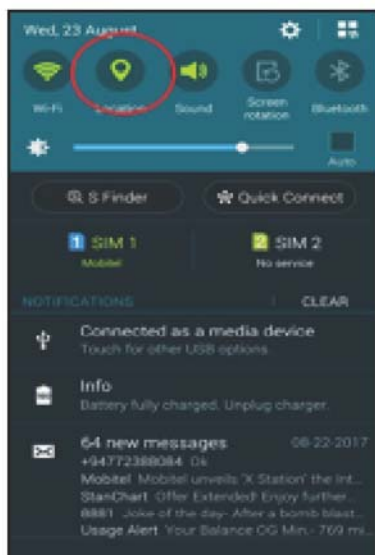
1.3. STEP BY STEP GUIDE FOR USING HEALTHMAP WITH A SMARTPHONE OR A TAB

The following step by step instructions are for smartphones as they are the primary tool to be used to map locations.



1.4. HOW TO UPLOAD INFORMATION ON TO HEALTHMAP VIA THE SMART PHONE APPLICATION

1. Turn on the Geolocation option on your phone by clicking on the 'Location' icon on the top option selection bar. You can view this by swiping down the screen of your smartphone.



2. Turn on the Geotagging setting in your phone camera.

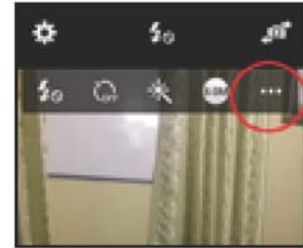
To set the Photo/Camera Geotagging follow the below steps as per the screen shots.



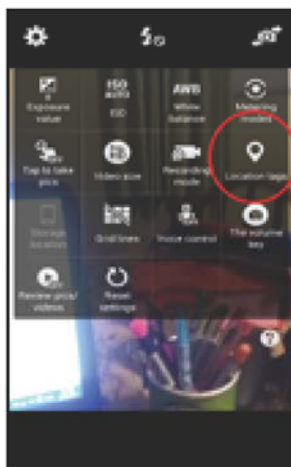
1 Click on Camera



2 Click on Camera Settings



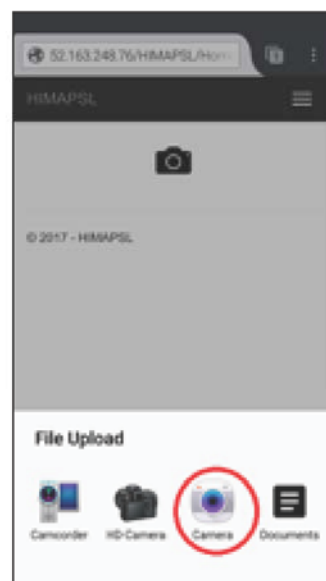
3 Click on Camera Advanced Settings



4 Select Location tags/
Geotagging

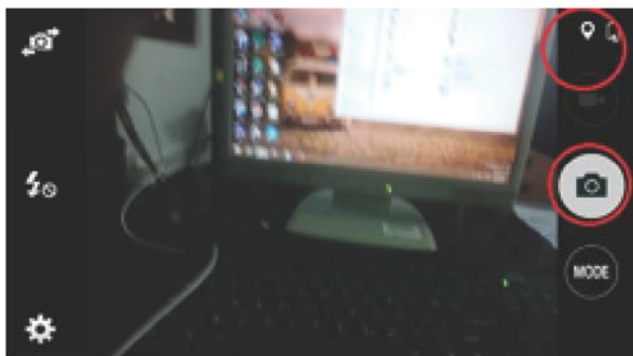
3. When you login, the photo capture window will appear.

4. Take a photo with your phone Camera.

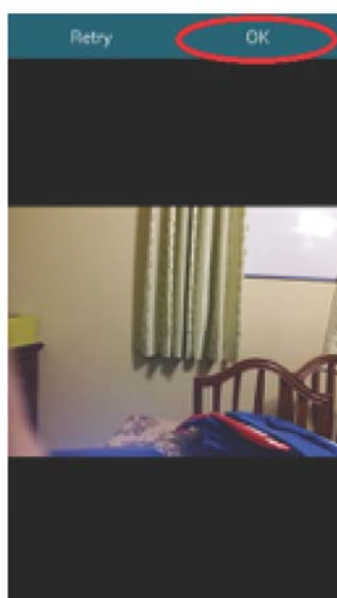


5. Click on the Camera Icon. This will open the 'File Upload' screen. Click on the 'camera' icon once more to turn on the camera.

Important Note: Please check to ensure that the geotag icon is not blinking. Hold the camera as shown below in order to have an upright photo in the final view.



6. You can now take your snapshot by clicking on the 'Camera' icon as shown above.



7. Click 'Ok' if you are satisfied with the image that has been captured. If not, click 'Retry' and repeat the steps to capture the desired image.

1.5 HOW TO VIEW AND ENTER LOCATION DATA

The screenshot shows a mobile application interface for entering photo details. The 'Photo Description' form has several fields: 'ID Code' (circled in red), 'Name' (with a dropdown menu), 'Lat' (7.274212, circled in red), and 'Lon' (80.823657, circled in red). Below these fields is a photo of a room with a window and a chair. At the bottom are 'Discard' and 'Save' buttons.

1. Once you have captured the desired image, you can enter the relevant photo details in the 'Photo Description' box.

2. First, check if the 'Lat' (Latitude) and 'Lon' (Longitude) data fields have values. If these fields are blank, press the 'Discard' button and start over.

3. If the 'Lat' and 'Lon' data fields are complete. Enter the health institution code in the 'ID Code' section.

Note: The list of Ministry of Health, Nutrition and Indigenous Medicine managed Hospital Identification codes (4 digit codes) are accessible via the link

http://www.health.gov.lk/moh_final/english/others.php?pid=160 This list can be used to determine the correct ID Code for the health institution you are mapping. The code should not be less than four digits. If the code is less than four numbers, add os in front of the digits. Ex: 285 => 0285

4. If you enter a valid code number, the name of the corresponding health institution will appear automatically in the 'Name' box.

5. If all details are correct, click the 'Save' button to save the photo and the Photo Description in the database.

This screenshot shows the same 'Photo Description' form, but now the 'ID Code' field is filled with '0000' and the 'Name' dropdown is set to 'DHC Wattappola-Panabokka'. The 'Lat' and 'Lon' fields remain the same. The 'Save' button is highlighted.

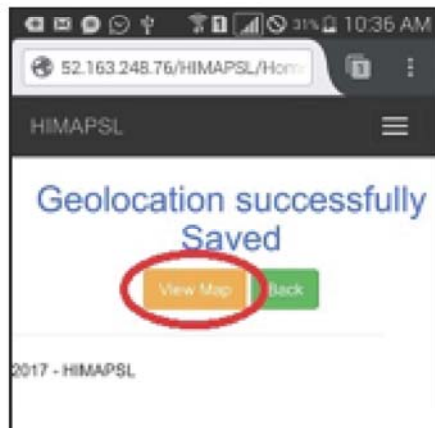


When you click 'Save' the information will be saved and a message will appear as shown.

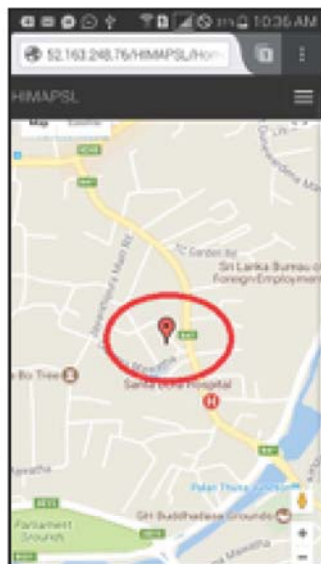
The screenshot shows a success message 'Geolocation successfully Saved' in blue text. Below the message are two buttons: 'View Map' (highlighted with a red circle) and 'Back'. The top of the screen shows the URL '52.163.248.76/HIMAPSL/Home' and the time '10:36 AM'.

1.6 VIEWING THE LOCATION ON THE MAP

1. Click 'View Map' icon on the 'Geolocation Successfully Saved' screen to view the saved location on the Map.



The Map location will appear as shown below,



1. Select satellite image
2. Zoom to the location



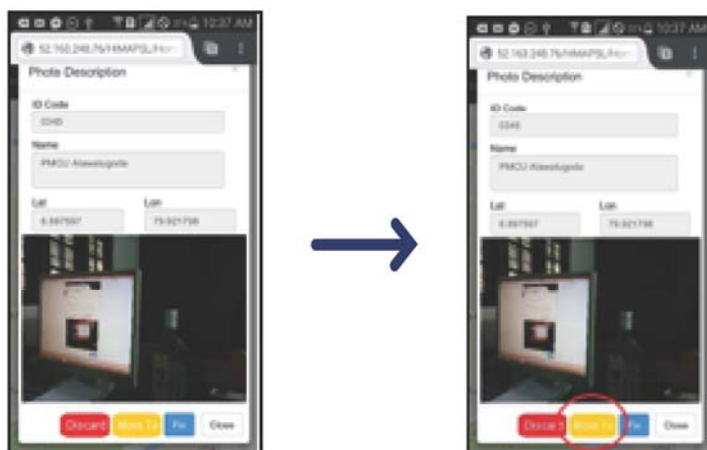
2. In the map view, you can switch to satellite mode, zoom in and check the location

1.7 MOVING AND FIXING THE LOCATION ON THE MAP

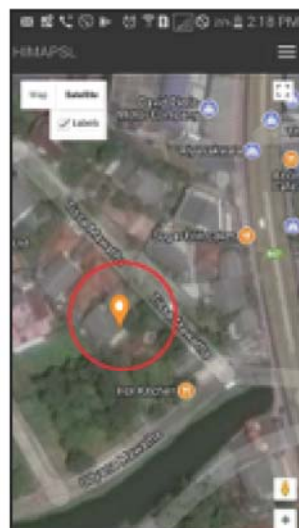
1. In the map view, click on the red location marker to open 'Discard/Move To/Edit' view.
2. If the Location appears correctly, click 'Fix'.

Clicking on 'Fix' will update the main database with the location of the health institution. Once you fix the location you will not be able to change or delete the location data.

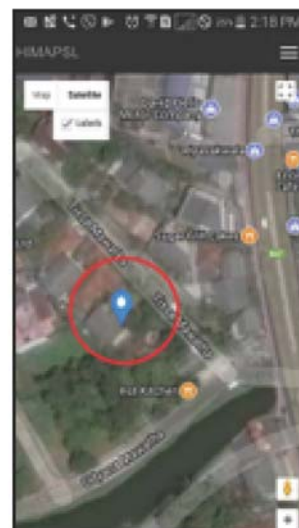
3. If the Marker is not positioned in the correct location on the satellite image, you can shift the location by clicking the 'Move To' button or delete the location using the 'Discard' button.



1. Tap/touch the correct location

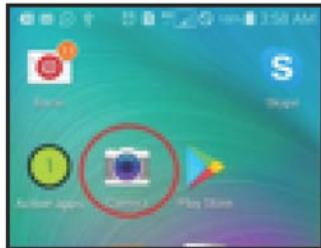


2. Then the marker will move to the correct location



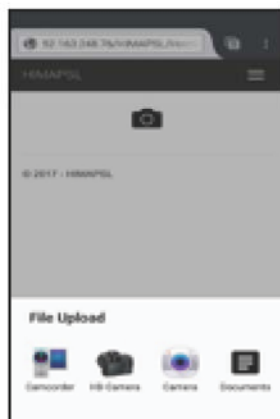
3. Open the 'Delete/Move' panel and fix the location

1.8 MAPPING IN AREAS WHERE MOBILE DATA COVERAGE IS LOW

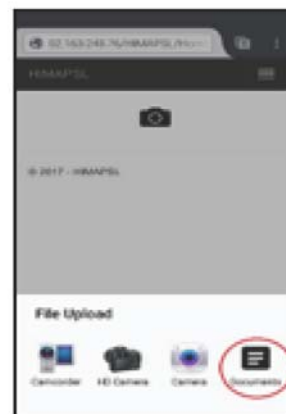


In the areas where the mobile phone signals are low, you can take a photo using your phone with Geolocation and Geotagging on without logging into the web. These photos can be saved/stored in your phone's photo storage application for uploading to the website when the user has better internet access or better coverage for the phone.

Follow the procedure until you see the following View:

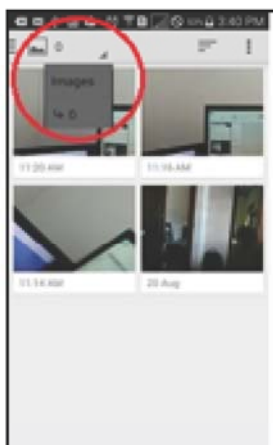


Select Documents

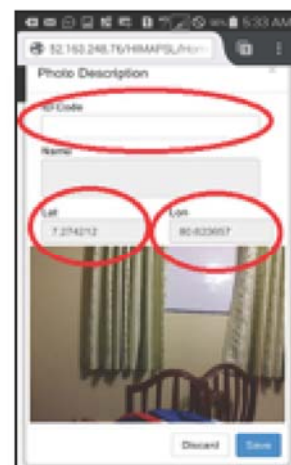


Once you reach the 'File Upload' screen, you can select the 'Documents' icon as shown above. This will open the photos and images location of your phone.

Please note: The way folders are organized in the mobile phones will differ from phone to phone. Therefore, you may have to select image location based on the way the folders are organized in your smartphone.



1. Select the Folder
2. Select the Photo



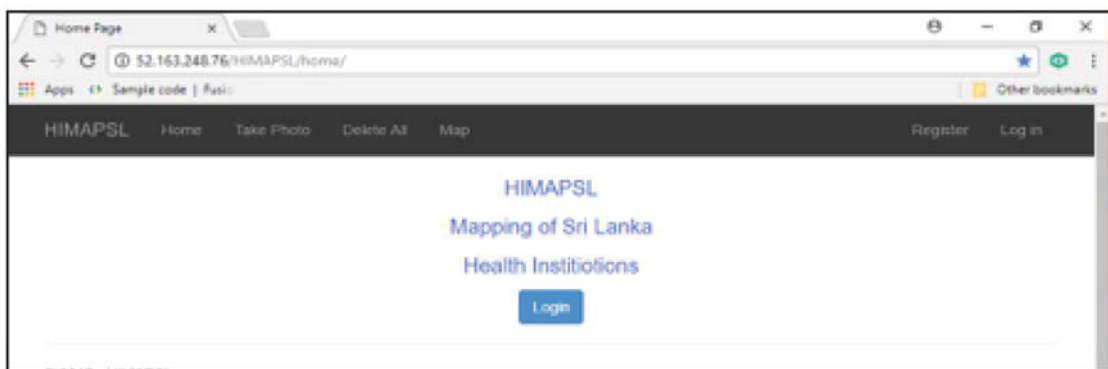
Follow the same process mentioned in sections 1.5, 1.6 and 1.7 above to complete the process.

1.9 MAPPING USING A DESKTOP COMPUTER

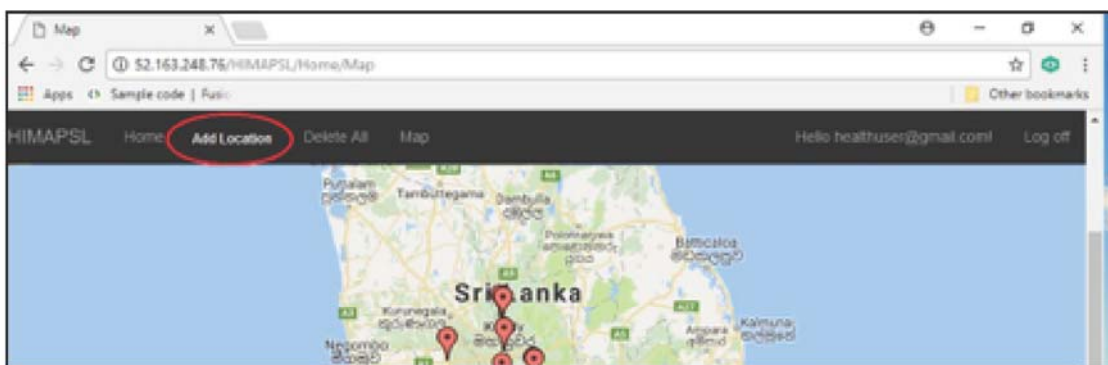
The following process can be followed by those who do not have access to a smartphone or would prefer the option to map the location using a desktop computer or tab.

For this process, the tab or the desktop should be connected to the internet.

1. Enter the HEALTHMAP website using the URL 'http://52.163.248.76/HEALTHMAP/HOME'. Login with your registered 'E-mail' and 'Password'.



2. After logging in to the system, click on the 'Map' tab on the Navigation Bar to view the map.



3. Zoom the map to the area where the health institution is located.
4. Click the 'Add Location' tab on the Navigation Bar.
5. Click on the correct location on the map.
6. The following popup window will appear on the screen,



1. Enter the ID Code (four digits)
2. If the ID Code is correct, the name will appear automatically



1. Click 'Choose File' button and select the saved photo
2. If you want to get the 'Lat' and 'Lon' fields from the photo, check 'Get Lat Lon from Photo' button
3. Photo will be loaded on to the form
4. Click 'save' button to save data

2. HEALTHMAP-PLANNING – GIS BASED DECISION SUPPORT SYSTEM

INTRODUCTION

HEALTHMAP-PLANNING is a GIS based software decision support system that has been developed as part of the ADB financed Sri Lanka: Health System Enhancement Project. The map will assist the health staff of the MOHNIM of Sri Lanka at the national and regional levels. As the ADB project was designed to include only four Provinces, currently the system only covers the four project Provinces – Central, North Central, Sabaragamuwa, and Uva.

KEY COMPONENTS OF THE SYSTEM

The HEALTHMAP-PLANNING comprises of two main components;

2.1 Windows Based GIS /MAP Desktop Application

This component is also currently in operation. This manual mainly covers the uses of the windows-based system.

2.2 Web Based GIS Application (Desktop/Smartphone)

This component provides mainly the viewing of the HEALTHMAP-PLANNING application over the internet. The application has been hosted in a Cloud Server.

2.1. HEALTHMAP-PLANNING –DESKTOP VERSION (HMDT)

HEALTHMAP-PLANNING Desktop version (HMDT) is a desktop GIS based application that offers many useful features for Health officials.

Key Information Sources

- Google Map/Satellite images as the base map
- Maps from Sri Lanka Survey Department – Grama Niladhari Divisions (GNDs)
- Information / Statistics from the Sri Lanka Department of Census and Statistics
- Health Department Institutional Information
- Health Department Regional Information

Basic Application Requirements

Following requirements are generally deemed adequate when using HEALTHMAP-PLANNING for Desktop. ,

- Windows 7 upward Operating System
- 500 MB Hard Disk space
- Preferably Core i3 upward processor
- Internet connectivity (while in use)

Installing/Launching HEALTHMAP-PLANNING Desktop

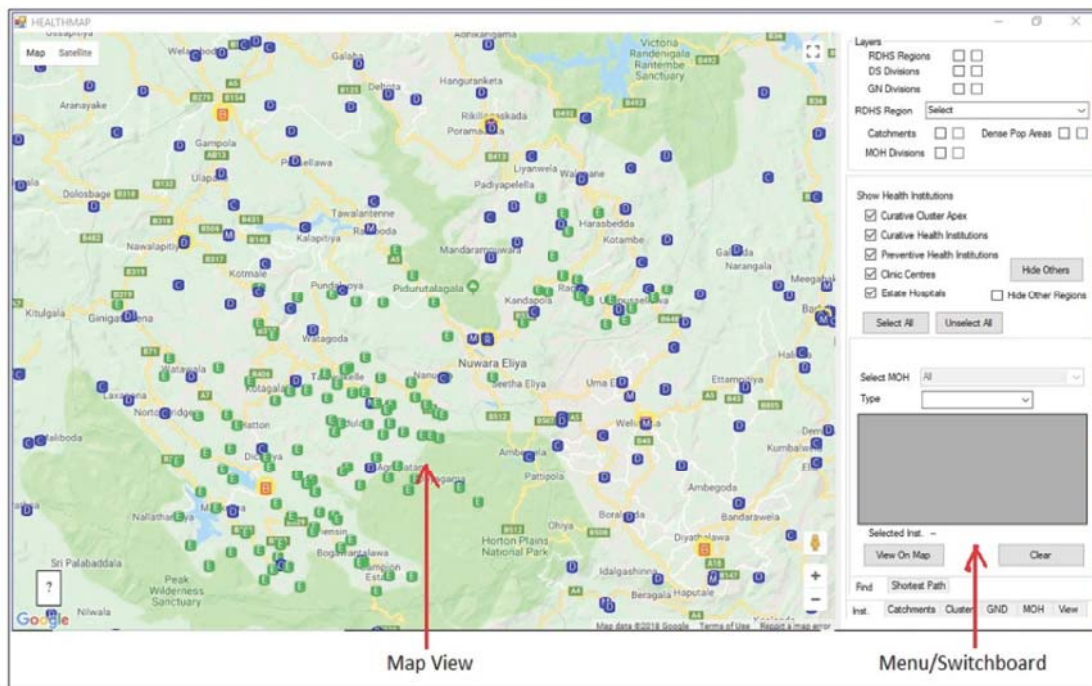
HEALTHMAP-PLANNING Desktop has already been installed in the computers of the Planning Divisions of all the nine Districts under the HSEP. However final version will be delivered and installed in the computers of the Planning Divisions shortly by the HSEP staff.

HMDT can be launched by clicking on the HMDT icon on the desktop screen

KEY FEATURES

Map View

The 'Map view' shows the geographical information of the area.

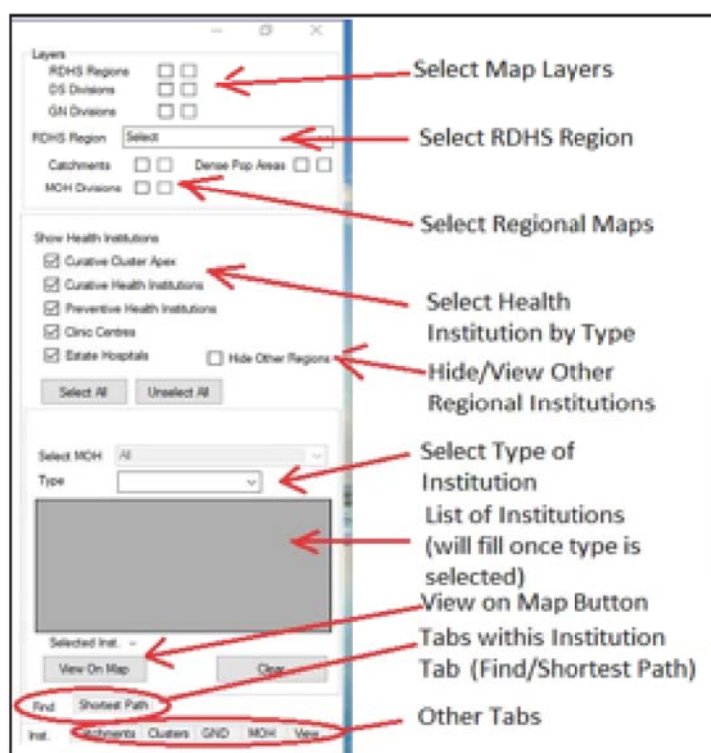


The system opens with the map showing the geographical locations of health institutions (provided the internet connection is active).

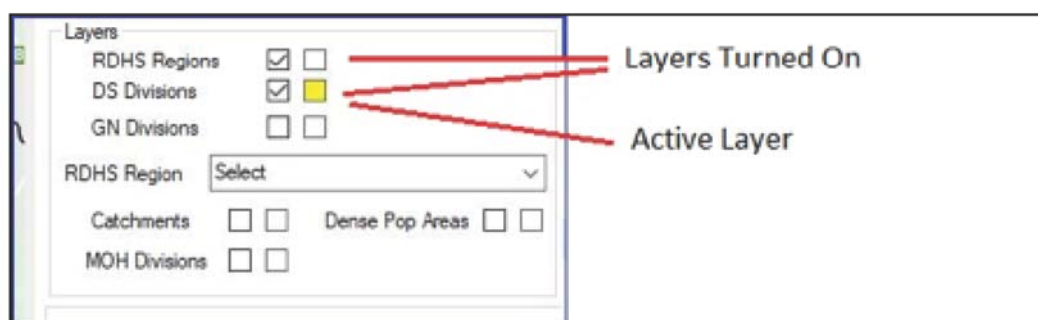
Menu/Switchboard

'Menu/Switchboard' provides the user selectable map layers and has several features and tabs the user can click to select and use specific tools.

Institutions Tab



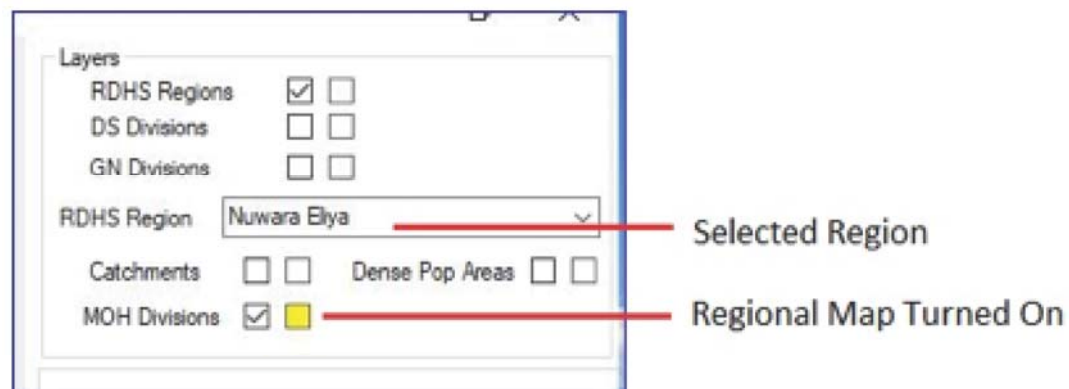
Selecting Map Layers



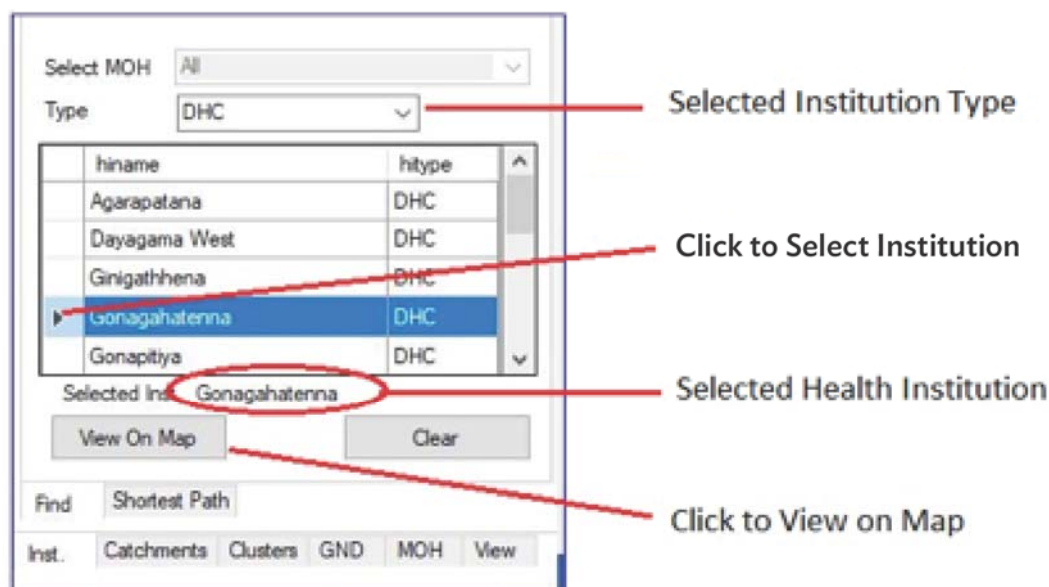
When selecting map layers, the user can click on the check box on the left to select or deselect the specific maps. It will turn on or turn off the respective map. The selected map will then be visible in the 'Map View'.

The user can also click on the checkbox on the right hand side to make the selected layer the 'Active Layer'. The 'Active Layer' will respond to the click of the mouse (In this case, the click of the mouse on the map will open an information window (info window) with DS Division details).

Selecting Regional Maps

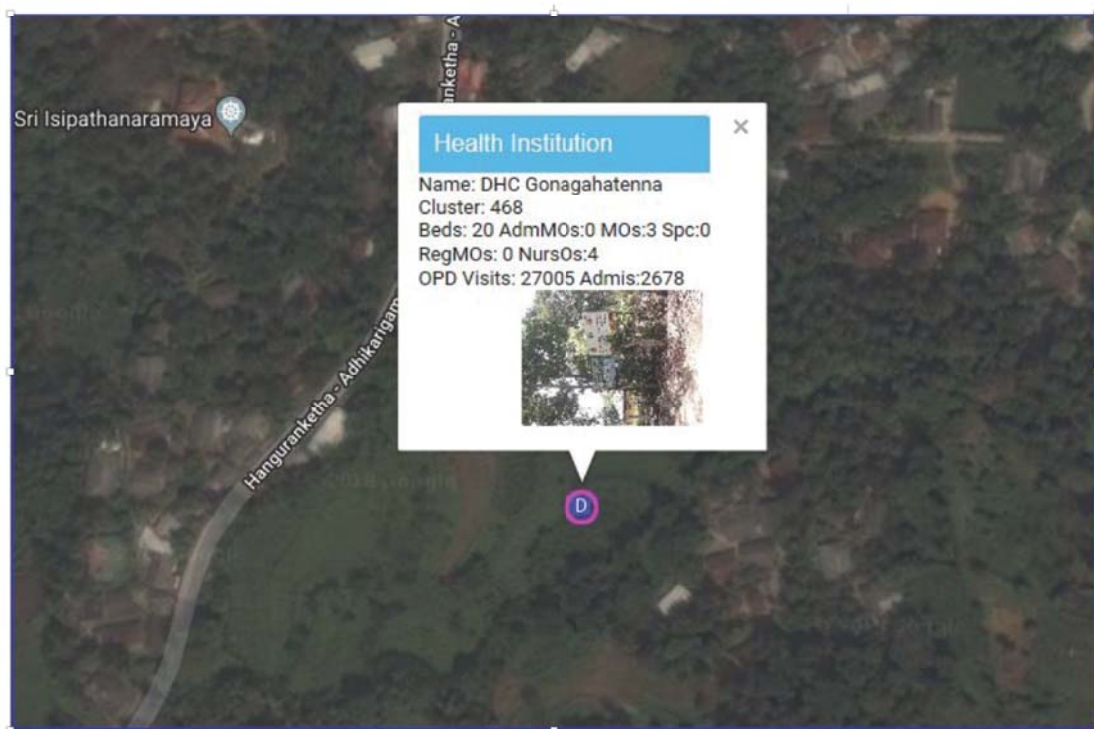


Searching for Health Institutions and Viewing on Map



Viewing the Health Institution

HEALTHMAP-PLANNING desktop will move the map to the selected location when you click on the “View on Map” button. The selected institution will be marked with a purple color circle. You can also switch to Satellite View to view a real time image.



Note: Click the “Clear” button after viewing the details in order to remove the purple color selection circle from the map.

Finding the Shortest Path

Select the ‘Shortest Path’ tab to make use of this facility.

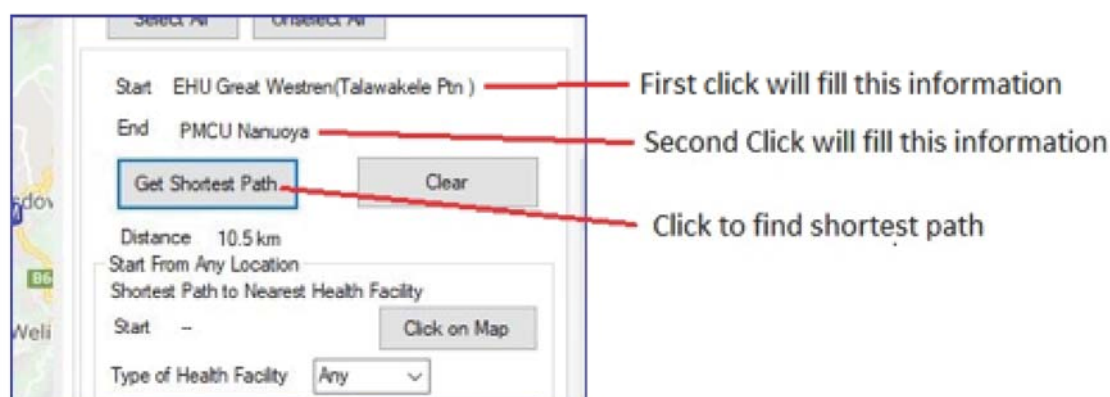


You can find the shortest path between,

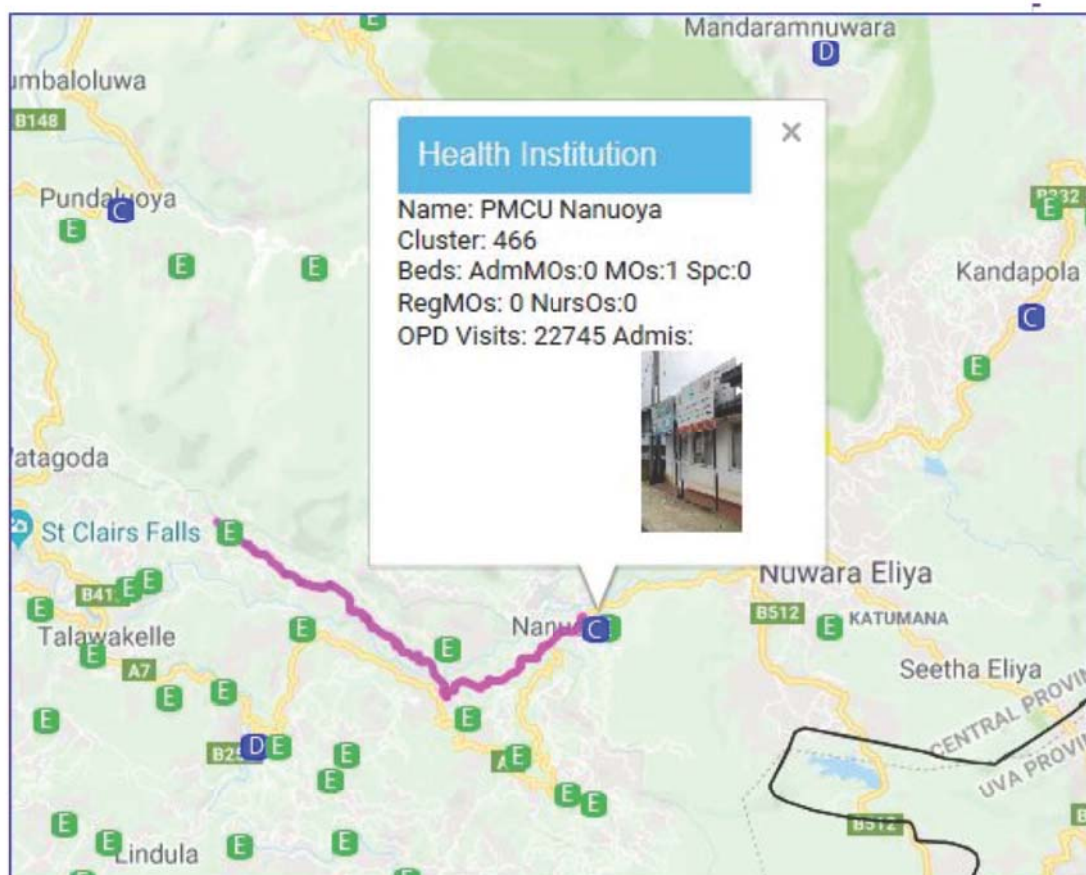
- Two selected institutions; and
- From any point on the map to the nearest Institution.

To Find the Shortest Path Between Two Selected Institutions

1. Select the first institution on the map by clicking on it's location and the second institution by clicking on the second institution's location;



HEALTHMAP-PLNNING Desktop will then show the 'Shortest Path' as below,



Creating a Catchment Map

Catchment population is the population that is served by a particular health institution. This is identified by using current health seeking practices and distance to the nearest facility of a community.

One of the important features of HEALTHMAP-PLANNING Desktop is its ability to create catchment maps of the Primary Health Institutions.

Catchment maps will be useful to visualize the populations served by a health institution and will be useful for health planning, for monitoring health services.

In order to create the catchment maps, HEALTHMAP-PLANNING Desktop will require you to upload the Grama Niladhari Divisions (GND) that serve a health institution in an MS Excel sheet.

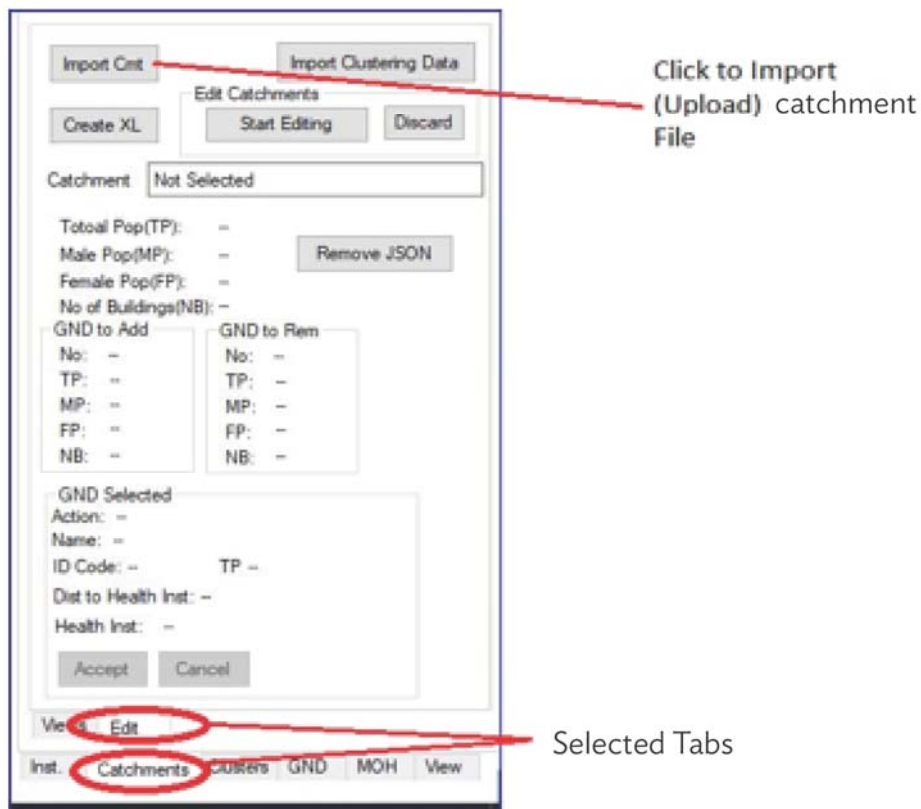
Typical Catchment Data File(MS Excel)

rdhscod	hi_code	hi_name	gnd_code	gnd_name
2	NE	466 Nuwareliya	2312185	Bulu Ela
3	NE	466 Nuwareliya	2312210	Goradihela
4	NE	466 Nuwareliya	2312175	Hawaeliya North
5	NE	466 Nuwareliya	2312180	Hawaeliya West
6	NE	466 Nuwareliya	2312080	Kalapura
7	NE	466 Nuwareliya	2312230	Kalukele
8	NE	466 Nuwareliya	2312225	Kelegala
9	NE	466 Nuwareliya	2312110	Kuduoya
10	NE	466 Nuwareliya	2303380	Kuduoya
11	NE	466 Nuwareliya	2303375	Labukele
12	NE	466 Nuwareliya	2312235	Magasthota
13	NE	466 Nuwareliya	2312300	Meepilipana
14	NE	466 Nuwareliya	2312165	Nuwareliya

These headings should match exactly

Once you have prepared the Excel sheet, you can import(upload) it to HEALTHMAP-PLANNING Desktop

1. Select Catchments tab.
2. Select Edit tab.
3. Click on "Import Cmt" button.



4. Point to the catchment file (the file you created above) and click open. HMDT will start processing the data and create catchments. You will be asked to load the cluster details if the catchment file is processed successfully.

Cluster Data File

Cluster data shall strictly be in a given format as follows,

	A	B	C	D	E	F
	rdhscode	apex_code	apex_name	member_code	member_name	
2	NE	467	DBHA Dickoya	469	DHA Maskeliya	
3	NE	468	DBHB Rikillagaskada	470	DHB Maturata	
4	NE	468	DBHB Rikillagaskada	471	DHA Walapane	
5	NE	467	DBHA Dickoya	472	DHB Bagawantalawa	
6	NE	467	DBHA Dickoya	473	DHB Kotagala	
7	NE	466	DGH Nuwara Eliya - (t	474	DHB Lindula	
8	NE	467	DBHA Dickoya	475	DHB Maldeniya	
9	NE	466	DGH Nuwara Eliya - (t	476	DHB Ramboda/Kotmale	
10	NE	466	DGH Nuwara Eliya - (t	477	DHB Udapussellewa	
11	NE	467	DBHA Dickoya	478	DHB Wetawala	
12	NE	467	DBHA Dickoya	479	DHC Agarapatana	
13	NE	467	DBHA Dickoya	480	DHC Dayagama West	
14	NE	467	DBHA Dickoya	481	DHC Ginigathhena	
15	NE	468	DBHB Rikillagaskada	482	DHC Gonagahatenna	
16	NE	468	DBHB Rikillagaskada	483	DHC Gonapitiya	
17	NE	468	DBHB Rikillagaskada	484	DHC Hanguranketha	
18	NE	468	DBHB Rikillagaskada	485	DHC High forest	

Headings should match exactly

Cluster Apex ID Code

Cluster Member ID Code

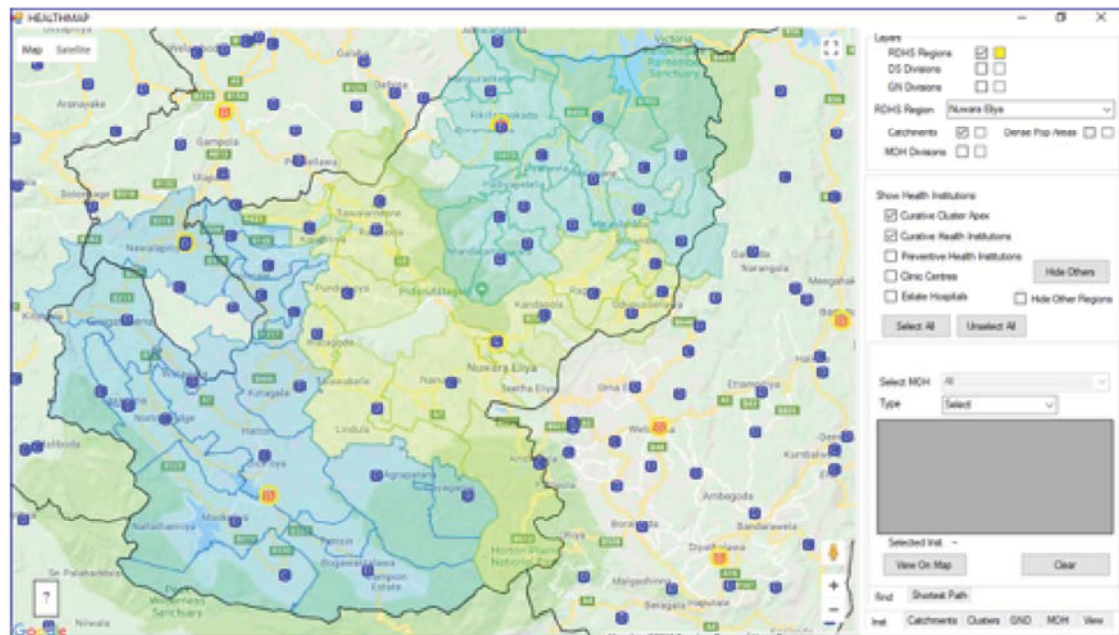
You can import the cluster data using the same tab,

The screenshot shows a software interface with several buttons: 'Import Cmt', 'Import Clustering Data', 'Edit Catchments', 'Create XL', 'Start Editing', and 'Discard'. A red arrow points to the 'Import Clustering Data' button with the text 'Click to Upload Clustering Data'. Below the buttons, there is a 'Catchment' dropdown menu showing 'Not Selected' and a 'Total Pop(TP):' field with a minus sign.

1. Click "Import Clustering Data" to upload Clustering data to the system.

You can turn on the catchments layer after this process is complete. The map will show the catchments and the clusters similar to the 'Map View' below

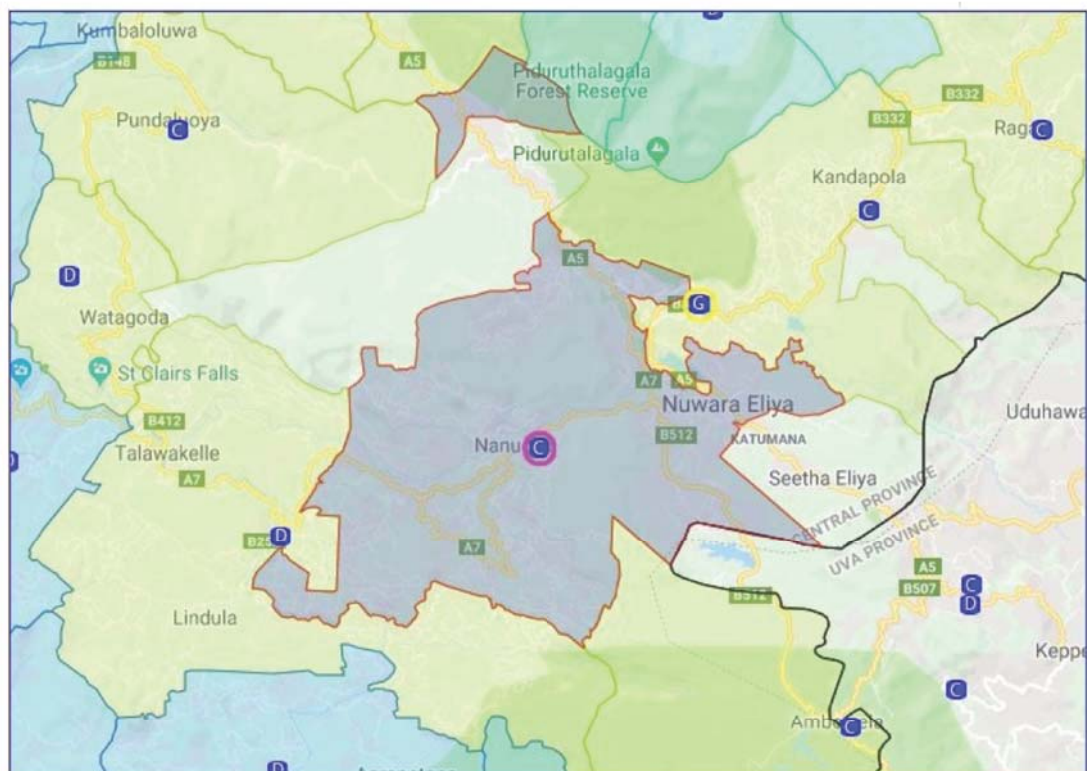
Viewing Catchment and Clusters in Map View



1. Catchments are shown as areas with darker boundary lines.
2. Clusters will have a single colour assigned to the members.

Viewing Details

You can see the catchment details by selecting the 'Catchment' tab. Go to the 'Views' tab and click on the catchment you are interested in viewing.



Data Pertaining to the Catchment

Layers

RDHS Regions

☐

☐

DS Divisions

☐

☐

GN Divisions

☐

☐

RDHS Region

Nuwara Eliya

▼

Catchments

☒

☐

Dense Pop Areas

☐

☐

MOH Divisions

☐

☐

Institutional Data

Name:

PMCU Nanuoya

Inst Code:

507

Beds:

Admissions

MO(Admin)'s

0

Specialists

0

MO's

1

RMO's

0

NurO's

0

OPD Visits

22745

Catchment Data

No Of GND

24

Total Pop:

59923

Dep Pop

22444

Wor Age Pop

37479

Male Pop

29467

Female Pop

30456

Views

Edit

Inst.

Catchments

Clusters

GND

MOH

View

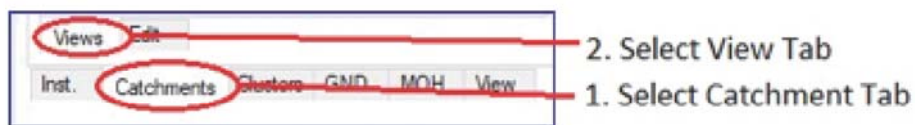
Institutional Data

Catchment Data

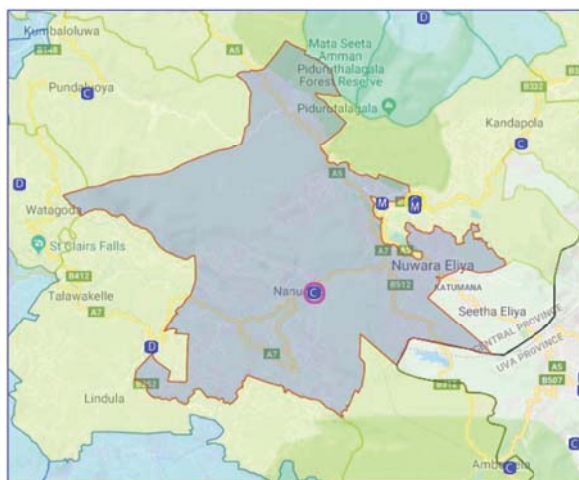
Editing Catchments

You can edit the catchment areas pertaining to the health institutions by detaching the GND areas from the current catchment and by attaching new GND areas to the catchment using the steps below,

1. First, ensure that the catchment layer is turned on. If yes, select the 'Views' tab under the 'Catchment' tab.



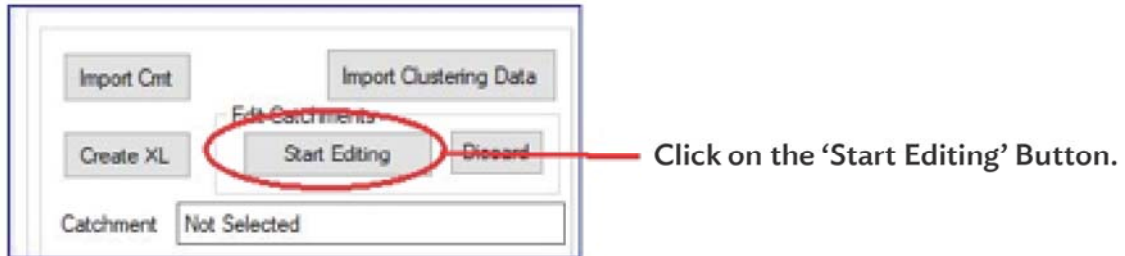
2. Click on the catchment area of the map that you want to edit.



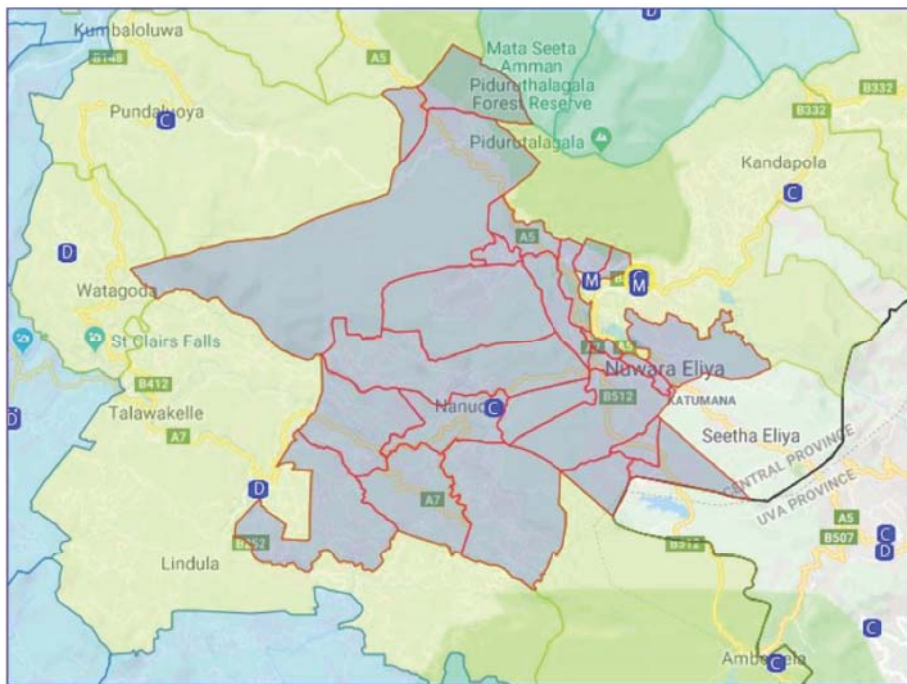
3. Select 'Edit' tab under the 'Catchments' tab.



4. Click on the 'Start Editing' Button.



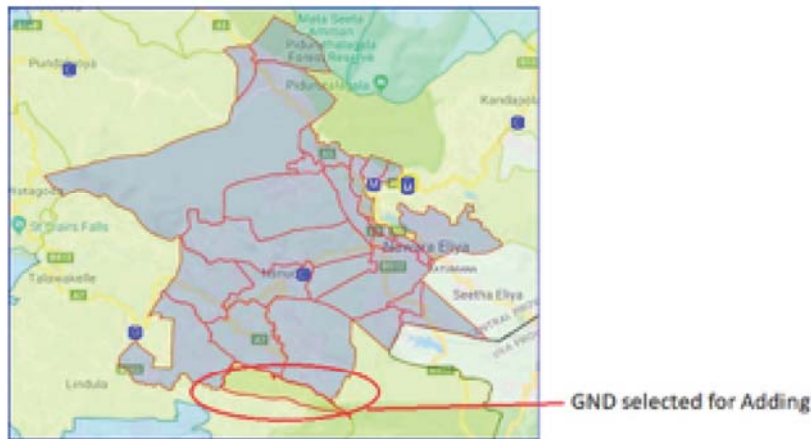
5. The catchment area on the map will disintegrate and show its member GNDs



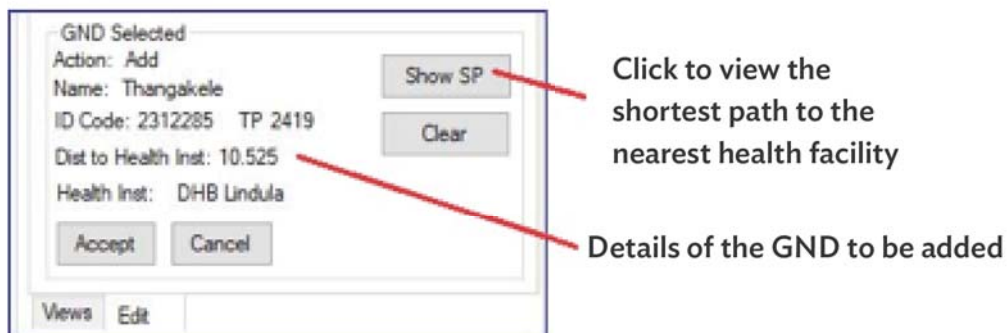
6. You can then 'Add' or 'Remove' GNDs from the selected catchment by following the below steps,

- Adding a GND to a catchment**

1. Hold down the 'A/a' key on your keyboard and click on the GND you want to add.



2. HMDT will show the GND you clicked with a different colour. The basic information associated with this GND will appear on the right hand side strip of the map.



3. Click on the Show SP (Shortest Path) button to visualize the shortest path (motorable road) to the nearest health institution to the selected GND. You will also be able to view the distance to the health institution by the shortest path here.

You can click on the 'Clear' button to remove the Shortest Path from the map.



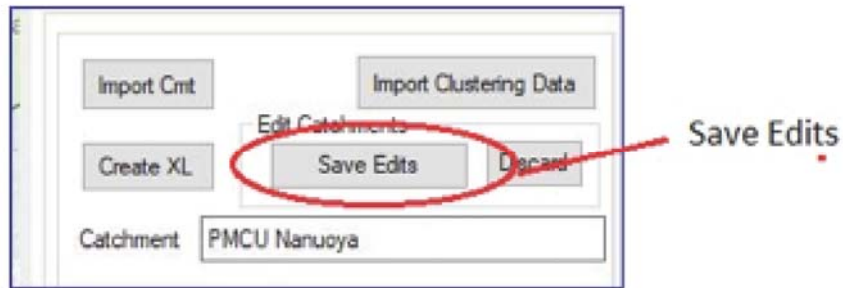
4. Click on 'Accept' if you want to continue the process of adding institutions or 'Cancel' if you wish to discontinue.

If you click 'Accept' the information will move to the 'GND to Add' information box.

Catchment: PMCU Nanuoya	
Total Pop(TP):	62680
Male Pop(MP):	30844
Female Pop(FP):	31836
No of Buildings(NB):	14743
GND to Add	GND to Rem
No: 1	No: -
TP: 2419	TP: -
MP: 1144	MP: -
FP: 1275	FP: -
NB: 492	NB: -

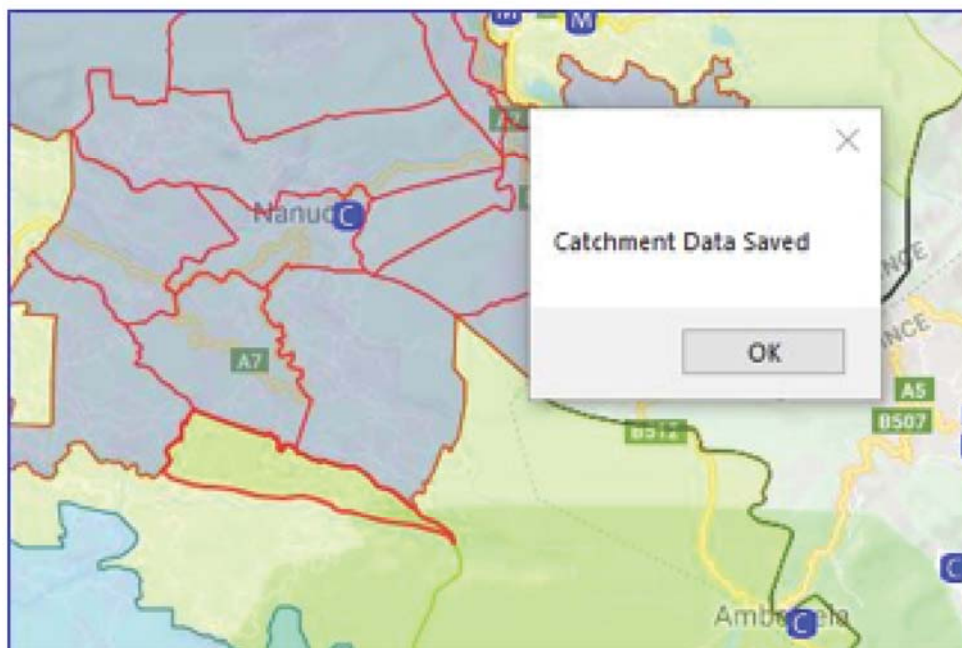
Data of GND to Add

5. Once you have selected the GND(s) to add, click 'Save Edits' button to save the data.



When you click the 'Save Edits' button, HMDT will start processing the data, update the database and create the new catchment maps.

However, the process may take some time. Once the update process is complete the HMDT will display a message to show the successful update as, 'Catchment Data Saved'.



6. Click 'OK' to display the updated catchment map.



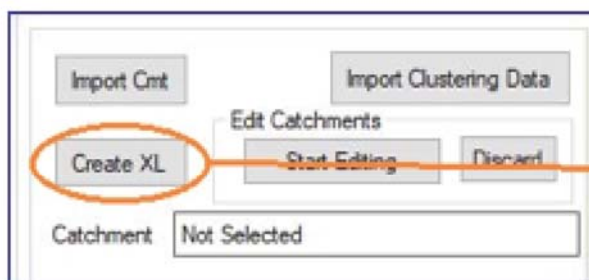
b. Removing a GND from a Catchment

In order to remove a GND from a catchment, follow the same steps as above. You can select the GND to be removed by holding down the 'R/r' key.

Generating an Excel File

You will need to generate Excel files of the modified catchments. These Excel files can be used for incorporating in reports and as input files for catchment information.

1. Click on 'Create XL' button to generate the Excel file.



Click on Create XL Button

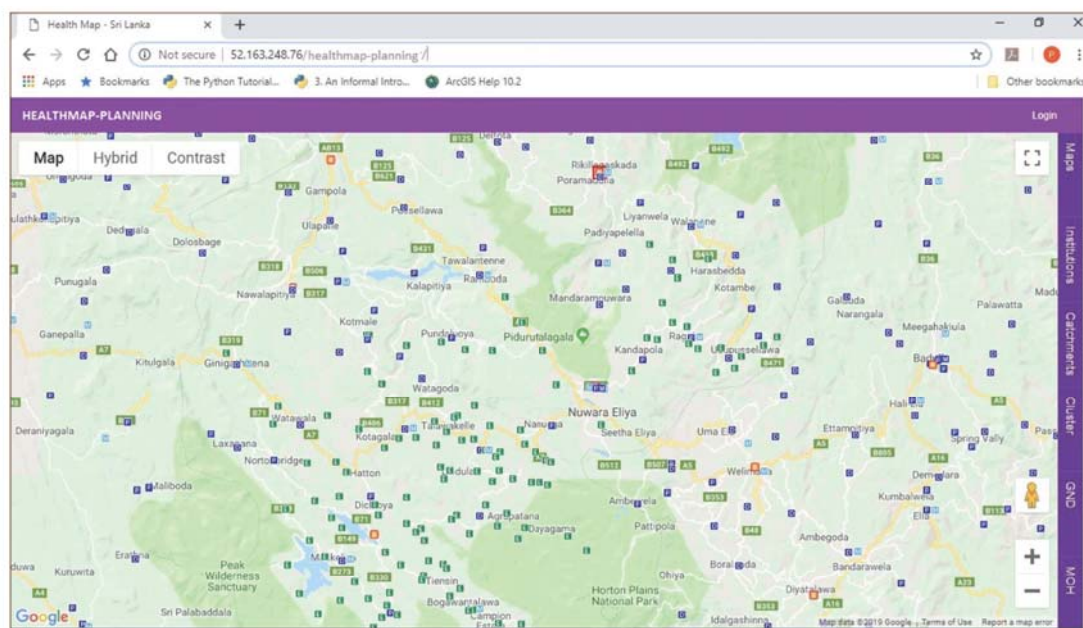
2.2 HEALTHMAP-PLANNING – WEB APPLICATION

HEALTHMAP-PLANNING is the web application providing information for the planning of the health care needs.

It is hosted in a Cloud Server. However this could be moved to the MOHIM Servers as necessary.

Accessing HEALTHMAP-PLANNING Web application

You can type <http://52.163.248.76/healthmap-planning/> in the URL space of your browser to access the application. This application has also been designed as a responsive application which changes its views and functionalities to match the accessing device (i.e Desktop or Smartphone)



HEALTHMAP-PLANNING web application is very similar in views with its counterpart desktop application and the step by step guide provided for the desk top application can be applied when using this application as well.

