

Identification and Removal of Mosquito Breeding Sites Using Whatsapp and Google Maps Replacing Gis in Meerut Cantonment

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Abstract

The easiest, inexpensive and most environment-friendly method to control malaria is by preventing the mosquito from laying eggs in stagnated water. Source reduction of mosquito breeding is effective measure for prevention of mosquito borne diseases especially dengue and malaria. The purpose of this study is to identify the source of breeding, pinning of precise locations and immediate implementation of remedial measures for removal of source of mosquito breeding sites.

Utilising the most popular messenger app (WhatsApp) with combination of Web mapping app (Google maps) as a tool for public health measure became very user friendly irrespective of the level of skill and inexpensive comparatively to GIS. This study has been carried under project name called "Vector Hunt".

Keywords: Vector hunt, GIS (geographic information system), WhatsApp and Google Maps

Introduction

GIS (Geographic information system) is defined as a special type of information system that is used to input, store, retrieve, process, analyse and visualize geospatial data and information in order to support decision making etc . Hence a GIS is basically a computer based information system for handling spatially referenced data and information ⁽¹⁾

In this project WhatsApp and Google maps has been utilised for successful geographical visualisation tools to locate the mosquito breeding sites from small to large size pockets. Not only locations of breeding sites that type of vegetation which surrounds the breeding sites can also be determined through this technique. This

project focused on very easy and user friendly method to identify sites precisely both manually and also remotely by pinning down the locations.

The easiest, cheapest and most environment-friendly method to control malaria is by preventing the mosquito from laying eggs in stagnated water ⁽²⁾. More than 3.9 billion people in over 128 countries are at risk of contracting dengue, with 96 million cases estimated per year. Malaria causes more than 400 000 deaths every year globally, most of them children under 5 years of age ⁽³⁾. Dengue cases have become serious public health problem in Meerut district affecting hundreds of lives and thousands of Indian lives ⁽⁴⁾. Being Meerut cantonment is one of the large cantonment using hygiene chemicals in such vast area is really expensive affair.

Major mosquito borne diseases like malaria and dengue are the fastest growing Vector borne diseases. Environmental management strategies that can reduce or eliminate vector breeding grounds altogether through improved design or operation of water resources development projects as well as use of biological controls (e.g. bacterial larvicides and larvivorous fish)

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that target and kill vector larvae without generating the ecological impacts of chemical use. At the same time, when other measures are ineffective and non-cost-effective, Integrated vector management makes judicious use of chemical methods of vector control, such as indoor residual sprays, space spraying, and use of chemical larvicides and adulticides; these reduce disease transmission by shortening or interrupting the lifespan of vectors ⁽⁵⁾.

In recent years, Geographic Information System (GIS) widely used in improving public health focusing on mosquito management to assist in minimising risk ⁽⁶⁾ but there are several pitfalls with this GIS which makes non handy at all levels. The cons compared with ‘Vector Hunt’ project has been illustrated in table 1 conclusion para.

In this project explored detecting small and large pockets of mosquito breeding at non habitual places which is real challenging. These small pockets are less visible to identify through GIS system and the accuracy of inference drawn from such data depends critically on the accuracy of each component. One can achieve a false sense of accuracy when a GIS layers a boundary map with minute detail ⁽⁷⁾. In recent years, information technologies have come to be widely used in improving public health while simultaneously reducing its cost ⁽⁸⁾.

Methodology

Project carried training under two categories (I) Job for trainees and (II) Job of trainer

Job for Trainees: It primarily includes training for WhatsApp users i.e. tradesman mate detailed for antify measures.

1) Popular apps WhatsApp and Google maps used as replacement for GIS. Reasons for choosing these apps are famous, user friendly, available in all mobile platforms (Android, IOS, KOais etc). Due to more number of android users, Android platform has been utilised to explain and same can be carry out in IOS platform too.

2) Trained to all staff/ trainees both skilled and non-skilled employees about particular feature of WhatsApp used in this project like ‘shared location’ where detailed staff share missed pockets and large Mosquito breeding

sites.

3) Step to share location: Open ‘WhatsApp’ icon, Tap the chats tab, open the conversation with corresponding contact, tap the paper clip icon and share the location

4) Due to availability of knowledge on usage of WhatsApp to all categories of employees and also easily available of large amount of internet in our country it has become easy in the project at all levels.

b) Optional: A new cheapest android mobile can be procure for this project, with new SIM card which can utilised for new WhatsApp account and for Gmail account which helps for recovery of password.

Job of Trainer:

It primarily includes compilation of data

a) Create an official Gmail account with dedicated username and password for this project.

b) Ten Steps has been explained along with pics how to Identify the sites, share the location, Compilation of breeding sites in google maps app, action on these location.

Steps:

a) **STEP 1:** Open google maps app & Log in to Gmail account, enter mail address and password to continue further. At the bottom of the screen there are few option icons.

b) **STEP 2:** Tap to ‘Saved’ option icon (Fig 1).

c) **STEP 3:** Create ‘New list’ as per convenience (Fig 1).

d) **STEP 4:** Name the list, Give list description and select List type as ‘Private’ for privacy.

e) **STEP 5:** Create list

f) **STEP 6,7,8)** Step 6,7 and 8 is job of trainee to use WhatsApp for sharing location of water collected sites irrespective of amount of water stagnated (Fig 2).

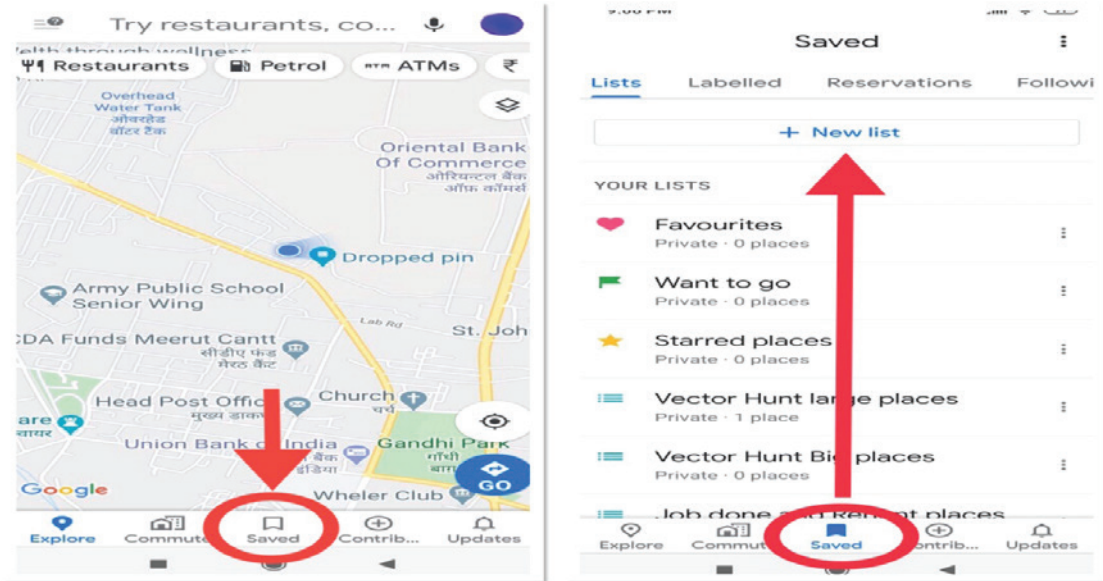
g) **STEP 9 :** Again step 9 starts with job of trainer, once location received in message form, click message and open. After ‘Red colour dropped pin logo appears’

name and save it to created list. Here in below example show Sewage treatment plant and saved it to created list (Fig 3).

h) STEP 10: Saved pin the red logo turns into blue logo as below. After appropriate preventive measures the finished task can be saved in another list for regular monitoring (Fig 3).

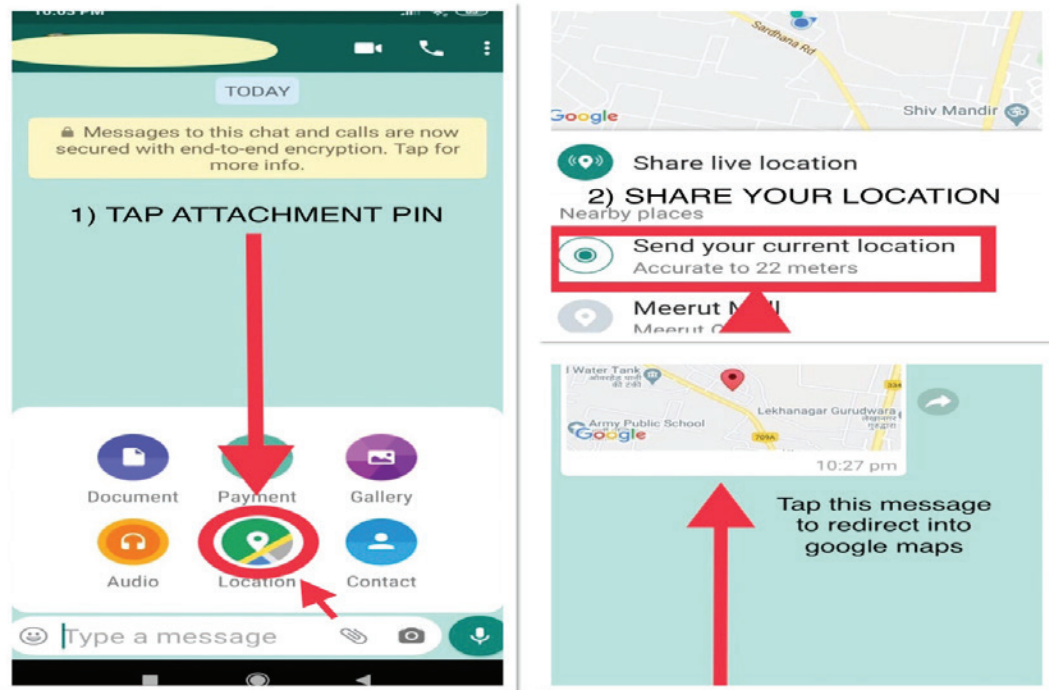
STEP 2 & 3 (Fig 1)

Figure explains how to save and create list



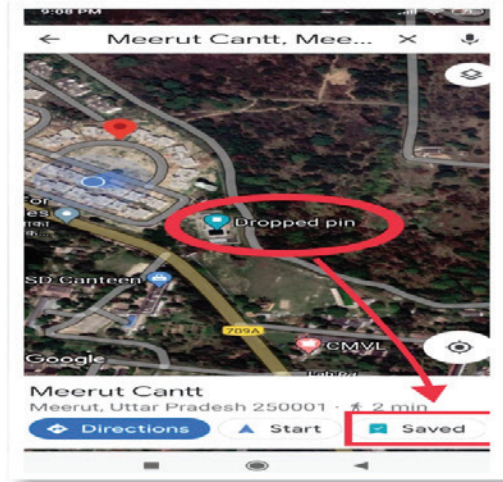
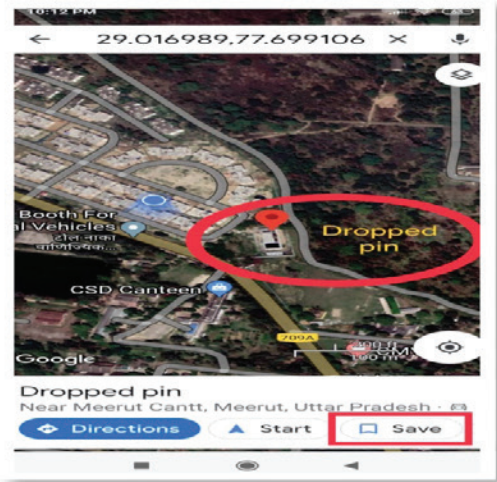
STEP 6,7 & 8 (Fig 2)

Description of sharing geo location through WhatsApp



STEP 9 & 10 (Fig 3)

Sewage treatment plant saved as potential source of breeding for regular birdwatch



Discussion and Conclusion:

This project became easier than GIS system due to easily available of real time satellite images and precise location. Based on this project the Pros and cons of the Vector hunt project and GIS system has been evaluated and as follows (Table 1)

Table 1: The comparison between GIS and readily available satellite images

| Functions | GIS | Vector hunt |
|---------------------------------|--|---|
| 1) Software | Expensive (9) | Inexpensive since available in all smartphones |
| 2) Data | Enormous data which need to modify, chances of error more and time consuming (9) | Simple touch and save, less chances of error and less time consume. |
| 3) Requirement of skill | High professionalism required for GIS layering | Not required since usage of WhatsApp and Google maps became common tool in day to day life. |
| 4) Internet connection | High speed wired internet requires to capture good quality images and also for further layering | Works on 2G internet also. |
| 5) User friendly | Non user friendly | User friendly to all and easily understandable |
| 6) Equipment | Computer / laptop mandatory | Only mobile is enough |
| 7) Field data and accessibility | Sometimes not understood due to poor rendering images and become incomplete or obsolete or erroneous | Not applicable |
| 8) Platforms | Available only in windows | Available in all mobile platforms like Android and IOS. |

Suggestion: Due to aware of commonly used applications in day to day life this system can be replace current existing GIS system and can be include in curriculum for awareness and implementation. This system also useful to map and monitor pump houses for assessment of outbreaks, overflow and uncovered septic tanks, water pipe line leakages, drainage blockages and can be used for containment plans pinning index case containment zone and buffer zones.

Ethical Clearance: Not Required (It does not involve any experimental data on humans) and the description for knowledge sharing purpose.

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