GHANA STATISTICAL SERVICE
2021 POPULATION AND HOUSING CENSUS

2021 PHC TECHNICAL MANUAL FOR FIELD IT SUPPORT TEAM

IT SUPPORT SERVICES

Contents

INTRODUCTION

The 2021 PHC faces unique challenges compared to previous censuses. In the past, one of the major challenges faced was a shortage of questionnaire during enumeration and delays in data processing. The 2021 PHC being a digital census, the anticipated challenges will be technological in nature. Anticipating some of the limitations that might be encountered in the upcoming census issues, an IT Field Support Team has been established alongside other units to resolve all technological issues that will arise in the field. The IT **support services** are critical to the successful implementation and usage of IT solutions deployed for the 2021 Population and Housing Census. During data collection, the IT Support is expected to play a ***"rover"*** role which in the context of 2021 PHC, means 'a trained expert who moves from one locality to another to resolve all IT related issues within a specific jurisdiction'. To meet the timelines and targets set for the fieldwork, IT Support officers are required to ensure prompt support to supervisors and enumerators in the field. IT Support officer need to follow step-by-step guidelines to execute its functions successfully. The services of the IT support will be performed under five major categories of issues and these are:

i. IT Management and operations
ii. Pre-training activities
iii. During training activities
iv. Field work support (IT Rover)
v. Field work finalization (Team Clearance and Data Backup)

It is imperative for the IT officers to understand and follow the best practices and Standard Operating Procedures (SOP) of how to deal and resolve issues that will emanate during the 2021 PHC fieldwork exercise.

CHAPTER ONE: IT MANAGEMENT AND OPERATIONS

The IT Support Officers were recruited, trained and deployed to provide technical support to the field officers. They are to ensure effective use of the IT solutions. The IT Officers (IT Staff) should be well managed in their operations, the structures have been defined to be followed in the provision of support at various levels.

SCOPE OF WORK

The field IT Support team will operate at three (3) levels: national, regional and district with varied functions. They will be represented as National, Regional and District IT team. The number of personnel at the district level will depend on the internet connectivity, riverine terrain and type of EAs (Type 1, Type 2 and Type 3).

1. **National IT (NIT)**

   The National IT will coordinate and manage the entire field IT support officers at the national level. The NIT has oversight responsibility for monitoring and ensure that all IT functions and responsibilities are carried out diligently at the regional and district levels. The NIT acts as the central and ultimate point of call on all IT solutions related to the census.

2. **Regional IT (RIT)**

   The regional IT (RIT) will operate within the assigned region with oversight responsibility for monitoring and provide assistance to all the DITs within the region to ensure that all IT related issues are solved and reported to National IT.

3. **District IT (DIT)**

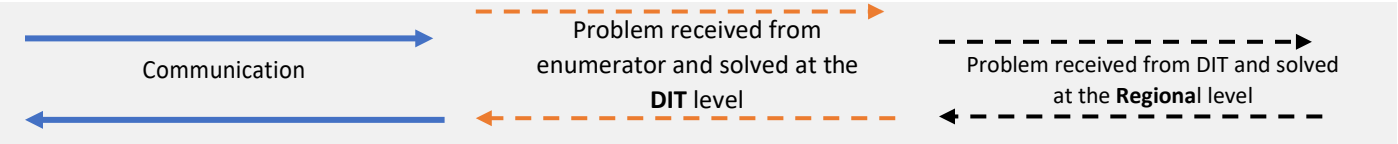
   The District IT Support Officer will operate within the district and has oversight responsibility for all IT related issues such as tablet preparation and provisioning at district level, validate payloads on tablets, distribution and retrieval of IT-related logistics, provide support at training, resolve data synchronization issues and any other IT issues that may be faced by the supervisors and enumerators during the training and the field work.

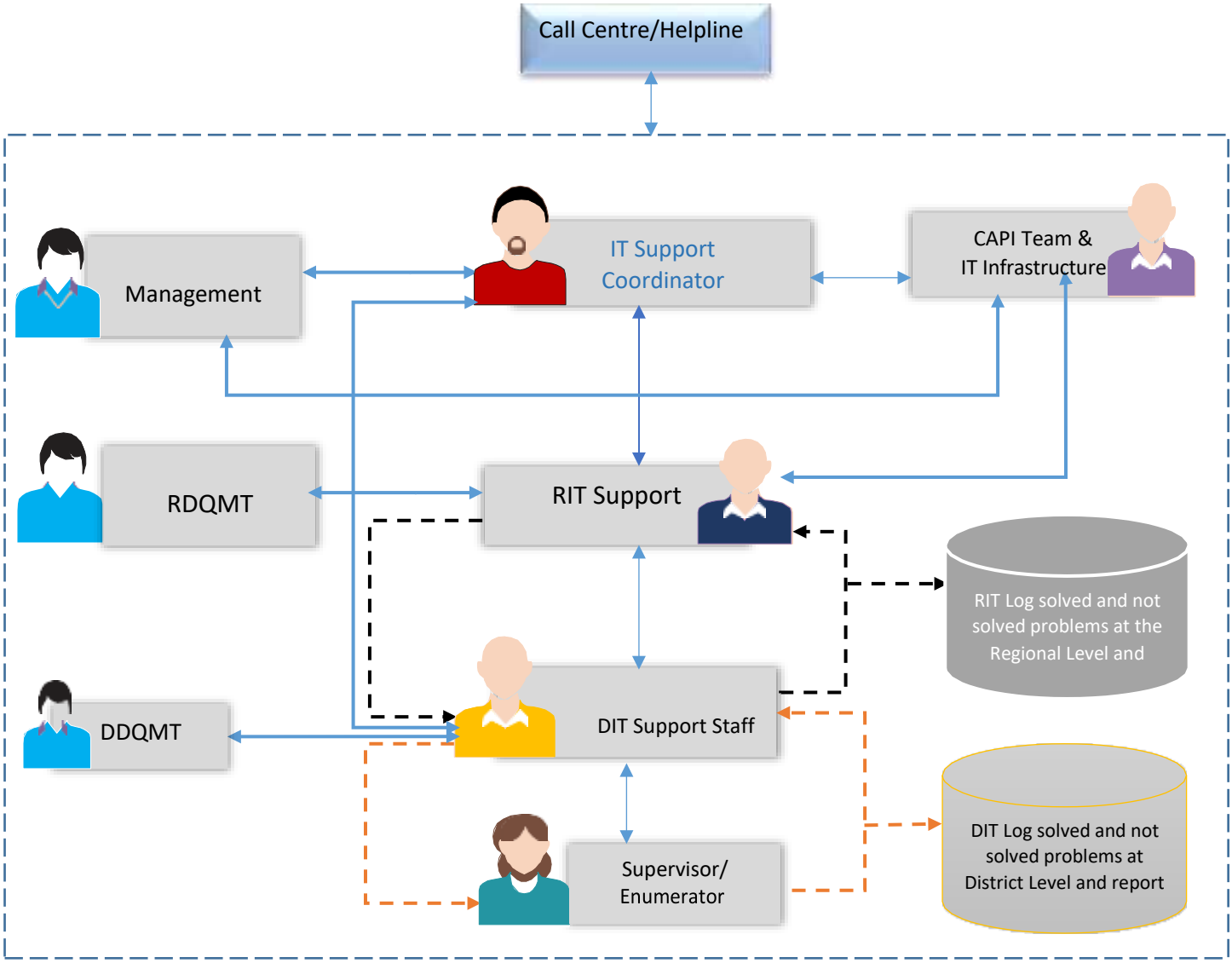
4. **Incident Response Team (IRT)**

   The incident response team (IRT) will operate within the assigned Zone to assist the DIT in resolving IT related issues encountered within the district.

IT SUPPORT FIELD OPERATIONAL DIAGRAM

Legend





IT SUPPORT ROLES AND RESPONSIBILITIES

Responsibilities of IT Support coordinator (ITC) and National IT Team (NIT)

The IT support coordinator and the National IT team will coordinate and manage the activities of the entire IT support officers at the national level. The ITC and NIT have oversight responsibility for monitoring. They are toensure that all IT functions and responsibilities are carried out diligently at the regional and district levels. The national team will act as the central and ultimate point of call on all IT solutions related to the census.

Responsibilities of Incident Response Team

The IT Incident Response Team (IRT) is a group of trained IT Support officers who step into any type of IT related emergency issues that might arise during the 2021 PHC.The Incident Response Team (IRT) will perform the following roles:

- a rover role at the zonal level as they move from one district to another within the assigned zone to resolve issues.
- support DITs with hefty work load during training and fieldwork
- stand-in for DITs who are indisposed due to ailment, accident or any temporal occurrences
- replace DITs who will vacate their work due to ailment, accident or any other unforeseen event
- perform any other functions that will be assigned by management

Responsibilities of Training IT Support Officer

- Setup projector and screen for effective facilitation
- Provide technical assistance by responding to request by both facilitators and participants
- Help prepare and assign tablets to supervisors and enumerators for field practice
- Help take proper inventory of all IT assets (eg. tablets and accessories) assigned to enumerators during and after training
- Retrieve all IT assets assigned to enumerators during training
- Prepare and assign tablets to supervisors and enumerators for main fieldwork immediately after training
- Help enumerators to be able to understand and navigate through the CAPI Application
- Solve or escalate hardware and/or software related issues during training to the DIT.
- Produce written report indicating issues, challenges, success, and experience
- Perform any other task assign

Roles and Responsibilities of DIT, RIT and RS		
District IT Role	Regional IT Role	RS Role
In a team work with the other DDQMT members prepare a place (warehouse) for storage of all IT asset allocated to the District	Coordinate to ensure compliance	Help Identify places to be used as storage of all the IT assets allocated to the various District
In a team work with other DDQMT members, take delivery of all IT assets assigned to the district and ensure optimum safety	Coordinate	Ensure storage places (Warehouse) are provided at all the district
Prepare all the necessary documentations (eg. inventory) upon receipt of the items	Ensure compliance and compile all the documentations received from DIT	Ensure compliance
Ensure all IT systems needed for the training are available, functioning and install at the center(s) for the enumerators training	Coordinate to ensure all IT systems needed at the various district training centers available	Provide all needed resources for the training
Lead in the preparation and assignment of tablets to participants during training and supervisors and enumerators for fieldwork immediately after training	Coordinate	Facilitators should help in the preparation of the tablet
Take proper inventory of all IT assets, including tablets assigned to enumerators	Supervise to ensure compliance	Ensure compliance
Provide onsite troubleshooting to problems	Provide technical Support to help solve issues	
Investigate and implement measures to rectify or enhance data synchronization	Assist the DITs to Investigate and implement measures to rectify or enhance data synchronization	
Support and ensure proper roll-out and installation of new tablet assignment and application updates by supervisors and enumerators	Coordinate, supervise to ensure compliance	Supervise and ensure compliance

Solve or escalate hardware/software related issues to Regional and national IT Support team for solutions	Coordinate and Help solve (hardware/Software) related issues received from the DITs or escalate to national for solutions	Ensure compliance
Backup all data file from supervisor and enumerator tablets during and after enumeration	Receive all District backup and send to HQ	Ensure Compliance
Provide daily and weekly reports (Incidents, hardware and software, work done etc.)	Receive report from DIT and provide regional level daily and weekly reports to management	Ensure Compliance
Ensure optimum security of enumerator's data back-up from tablet	Ensure optimum security of District data backup received from the DITs	Monitor and ensure compliance
Retrieve all IT assets assigned to field officers	In collaboration with RS, ensure all IT assets allocated to all the districts are retrieved	Ensure all IT assets allocated to all the districts within the region are retrieved
Handover all tablet, other IT assets and necessary documentations to RS and Regional IT to be transported to HQ	Receive all IT assets and documentations from the DIT for clearance	Supervise the receipt of all IT assets and documentations from the DIT for clearance

MODE OF COMMUNICATION

IT support Team will communicate with the field officers and management via:

- E-mail
- WhatsApp
- Phone Calls
- Text Messages (SMS)
- Face-to-face
- Video conference (ZOOM)
- Team viewer

LOGISTICS NEEDED FOR FIELDWORK

The IT Support requires the following tools and logistics to be able to execute its mandate effectively

- Laptop
- Tablet
- Power Bank
- OTG Flash drive Internet
- Call Credit
- Software - SQLite (DB Browser), CSPro, Android Mirror App etc.
- Means of Transportation (Car, Motor)
- Bag (Backpack)

THE IT OFFICER'S ETHICS AND BEHAVIOR

The IT Officers will play important role in the 2021 PHC fieldwork exercise in assisting field officers with all CAPI related problems. The IT Officers are therefore required to observe and adhere to ethics and behavioral practices in discharging their responsibilities and to be conversant with the "dos & don'ts" on the field in order to follow the Standard Operating Procedure (SOP)

Conduct of IT Officers

. IT Officers must do the following:

- Work through to the end of the Census
- Work full-time without engaging in any other activity.
- call for support of other DQMT where necessary; e.g. workload management
- do not delegate your work as an IT officer to another person
- Do not use your personal laptop to take backup.
- Do not disclose to anyone, except to Census Officials, any of the information you receive in the course of your duties as an IT officer
- Never discuss issues relating to politics or religion, nor must you allow yourself to be involved in any controversial arguments
- Put on simple but decent clothes, which will not frighten, intimidate or offend any person.
- Discuss all your problems and uncertainties with your superiors
- Do not permit any unauthorized person to accompany you on your visits
- Always be patient, tolerant, courteous and friendly
- Be a team player
- Pay attention to details

Appearance of Field Officers

The Golden Rule: Dress to blend with the social environment of the community. In a nutshell:

- Put on simple but decent clothes;
- Remember to wear your Census Jacket and ID card at all times
- Wear your face mask at all times during the fieldwork

i. Decent Clothes and recommended footwear

Note: The clothes you put on as an IT Officer are important as the census itself. Therefore, the Field Officers should be neatly dressed and should not wear fancy clothes.

ii. Provocative/indecent dresses and hairstyles

Do **NOT** wear any attire to frighten, intimidate or offend people. Avoid:

- Clothes worn by soldiers, police officers or prison officers;
- Provocative/indecent dresses and hairstyles;
- Large necklaces and long earrings;
- Too much makeup; and
- Long finger nails

Communication Skills

The Field Officers must utilize the following communication skills:

- Establish a good rapport with field officers;
- Handle difficult/reluctant field officers tactfully;
- Record information accurately;
- Be courteous, patience and tactful;
- Keep to appointment times
- Always talk politely

Time management

IT officers can improve time management by;

- Planning ahead of time
- Prioritize tasks
- Start tasks early
- Schedule tasks and deadlines
- Use technology to ease work
- Focus on one tasks at a time

IT officers should manage their time to;

- Increase productivity
- To meet deadlines
- To conform with timelines
- To reduce time spent on non-priorities

DATA PROTECTION & INFORMATION SECURITY

The recognition of the right to privacy with respect to the processing of personal data or information led to the passage of the Act 843 to further guarantee the right to privacy enshrined under Article 18(2) of the 1992 Constitution. Data generated in the country are kept across networks and on various filing systems of which this 2021PHC is no exception. These information systems used in the collection and storage of such personal information can therefore pose a threat to one's right to privacy thus the need for data protection

What is Data Protection?

- **Data Protection** is the process of safeguarding important information from corruption, compromise or loss
- **Data Protection** ensures that data can be restored quickly after any corruption or loss.
- **Data Protection** ensures that data privacy is maintained

Assets of Information Security

- **Confidentiality:** Confidentially means information is not disclosed to unauthorized individuals and institutions
- **Integrity:** means maintaining accuracy and completeness of data. This means data cannot be modified in an unauthorized way
- **Availability:** Means information must be available when needed

Ensuring Confidentiality, Integrity and Availability (CIA)

IT Officers MUST adhere to the following measures in protecting data

- Do not share or allow any unauthorized person to have access to your device
- Ensure your laptop is protected with a password and screen lock when away from it
- Do not copy data from the laptop/tablet for unofficial activities
- Do not use the laptop for unofficial activities, such as web surfing, watching movies or playing games

IT Officers MUST adhere to the following measures in managing data

- Be careful of malware when inserting any untrusted removable storage devices into your official machines
- Do not download unauthorized applications on any official machine, and if the need be, only from trusted sources

Measures for Protecting and Securing Data

- Always lock the laptop to prevent unauthorized access
- You must SCAN every drive before opening it on a laptop
- Every opened window on the desktop MUST be closed when you are stepping out
- Laptops must be handled and used with special care to avoid physical damage and theft
- Data must be backed-up regularly and timely
- Handle the devices like your own personal property

Data Management Guidelines

Managing Data Accessibility

- Controlling confidentiality is, in large part, about controlling ***who*** has access to data.
- Access is granted to ONLY authorized field officers within a pre-defined jurisdiction (***where***)
- Data can be accessed during field work and team clearance (***when***)
- Levels of Authorization for accessing Census Data
    - Data Monitor
    - District I.T. Officer

Measures for Managing Data Accessibility

- Ensuring that DM or DIT **DO NOT** have access to data outside their authorized locations.
- Protect devices from misuse or theft by storing them in locked areas.
- Never leave devices or sensitive documents unattended in public locations.
- Ensure that removable devices are always kept secured to avoid breach of information or data loss.

CHAPTER TWO: PRE-TRAINING ACTIVITIES

IT LOGISTICS PACKAGING AND ASSET MANAGEMENT

Logistics packaging and management

Is the process of preparing the IT assets for safe, secure, efficient and effective handling, transportation, distribution, storage both at the Head office and on the field. The IT officers need to know how the tablets and other assets have been packaged

What is Tablet provisioning?

It is the process of setting up the tablets for use by loading all the required resources (Payloads) that will be needed for the 2021 PHC field work. One of the most important activities that cannot be compromised is the tablet provisioning

Provisioning at the Head Office

In getting tablets and laptops prepared for the 2021 PHC field officer training and field work. The IT Asset management team goes through series of processes to get things done at the head office before being dispatched to the various regions and districts.

The following activities are executed during provisioning stage at the head office

- Receive tablets/laptops from Stores
- Unbox the tablets
- Tag tablet boxes with unique numbers
- Capture serial numbers, IMEI numbers and Unique numbers of the tablet and laptop
- Tag tablets with the Login IDs and SAs
- Turn on Tablets and proceed with initial configuration process
- Setup date and time
- Rename tablets to Login IDs
- Rename laptop
- Install all the required application on laptop
- Deploy all payloads unto tablet (CSEntry, 2021 CAPI Application, EA Maps, PHC 2, Interactive Map, PDF reader, QR code Scanner)
- Perform final checks to validate work done (Verifications)
- Arrange tablets according to SAs with serial numbers pasted on the containing boxes
- Box all the tablet in their respective labeled big boxes
- Arrange boxes based on district allocation for dispatch

It Assets/Document from Head Office expected to receive at the region and district

- Tablet (Charger Head and USB Cable, SIM Card & SD Card)
- Power Bank
- Tablet Case
- Laptop and accessories
- IT Assets inventory list (.xlsx)
- Store Waybill

Note: *Total number of logistics to be received at the District will vary across different districts based on the number of trainees to be invited for training.*

Tagging and labeling

All IT assets are tagged and labelled in order to properly track and manage the allocations to the various regions and districts respectively. Tagging and labeling IT assets such as Tablets, Laptops and Power banks follows a specific standard naming conversions and as IT officers, this needs to be understood by all in order to be able to unbox and distribute at the reg

Huawei Tablet

1. Tablet type

There are three different brands of tablets to be used for the 2021 PHC. These are

Samsung Tablet

BioWolf Rugged Tablet

Tablet Tagging/Labeling

All the three types of tablets to be used for 2021PHC are tagged and labelled on the *tablet, tablet box and Device name (Bluetooth name).* All the tag numbers are linked to a unique serial number of the tablet and this will help to effectively track and take inventory of these asset at national, regional and district level. Theses assets will be assigned to a Supervisory Area (SA) and Enumeration Area (EA) within a specific District.

The tablet is tagged with IT asset *tag number* which is five (5) digit and the field officers *login ID* which is twelve (12) digit code.

Example 1

If a tablet is assigned to *Bunkpurugu Nakpanduri* District in the North East region, this is how the tablet and the box will be tagged and labeled:

Supervisor's Tablet: Login: 140400100 Tag No: 40206 (On the tablet, Bluetooth name and tablet box)

Enumerator's Tablet: Login: 140400101 Tag No: 40207 (On the tablet, Bluetooth name and tablet box)

Old Labeling

New Labeling

Label for Huawei Tablets - SUPERVISOR

Label for Samsung Tablets - ENUMERATOR

Label for Huawei Tablets - SUPERVISOR

Label for Samsung Tablets - ENUMERATOR

Box Label for Huawei Tablets

Box Label for Samsung Tablets

Inventory and Way Bill

Table 1: Summary of IT Assets to the Region

Tablet Summary For North East				
District	**SA**	**Main Tablets**	**5% Contigencies**	**Total**
BOLE	20	315	16	**331**
SAWLA TUNA KALBA	29	433	22	**455**
NORTH GONJA	12	184	9	**193**
WEST GONJA	13	175	9	**184**
CENTRAL GONJA	34	577	29	**606**
EAST GONJA	51	444	22	**466**
NORTH EAST GONJA	13	138	7	**145**
Total		2266	114	2380

Table 2: Summary of SIM cards to the Region

Ghana Statistical Service

Date: June, 13th 2020

Source: IT Infrastructure

Sim Cards

No.	District	Network	Total number
1	Bunkpurugu Nakpanduri (Bunkpurugu)	Sim cards (Vodafone)	241
		Sim cards (MTN)	100
2	Mamprugu Moagduri (Yagaba)	Sim cards (Vodafone)	200
		Sim cards (MTN)	41
3	West Mamprusi Municipal (Walewale)	Sim cards (Vodafone)	458
		Sim cards (MTN)	200
4	Chereponi	Sim cards (Vodafone)	272
		Sim cards (MTN)	100
5	Yunyoo Nasuan	Sim cards (Vodafone)	211
		Sim cards (MTN)	100
6	East Mamprusi Municipal(Gambaga)	Sim cards (Vodafone)	538
		Sim cards (MTN)	200

Table 3: Tablet Allocation Sheet by District

No.	Disrict Name	Region Code	District Code	SA	Role	Enumerator ID	Role Name	Box Number	Asset Tag	Serial Number
1	GUSHIEGU	12	16	001	00	121600100	Supervisor	508 (H-085)	05432	WBM4T20114004871
2	GUSHIEGU	12	16	001	01	121600101	Lister	508 (H-085)	05433	WBM4T20114005050
3	GUSHIEGU	12	16	001	02	121600102	Lister	508 (H-085)	05434	WBM4T20114005019
4	GUSHIEGU	12	16	001	03	121600103	Lister	508 (H-085)	05435	WBM4T20114004931
5	GUSHIEGU	12	16	001	04	121600104	Lister	508 (H-085)	05436	WBM4T20114005202
6	GUSHIEGU	12	16	001	05	121600105	Lister	508 (H-085)	05437	WBM4T20114005029
7	GUSHIEGU	12	16	001	06	121600106	Lister	508 (H-085)	05438	WBM4T20114004975
8	GUSHIEGU	12	16	001	07	121600107	Lister	508 (H-085)	05439	WBM4T20114005035
9	GUSHIEGU	12	16	001	08	121600108	Lister	508 (H-085)	05440	WBM4T20114004863
10	GUSHIEGU	12	16	001	09	121600109	Lister	509 (H-086)	05441	WBM4T20111000919
11	GUSHIEGU	12	16	001	10	121600110	Lister	509 (H-086)	05442	WBM4T20111001293
12	GUSHIEGU	12	16	001	11	121600111	Lister	509 (H-086)	05443	WBM4T20111001292
13	GUSHIEGU	12	16	002	00	121600200	Supervisor	509 (H-086)	05444	WBM4T20111001339
14	GUSHIEGU	12	16	002	01	121600201	Lister	509 (H-086)	05445	WBM4T20111000254
15	GUSHIEGU	12	16	002	02	121600202	Lister	509 (H-086)	05446	WBM4T20111000281
16	GUSHIEGU	12	16	002	03	121600203	Lister	509 (H-086)	05447	WBM4T20111001291
17	GUSHIEGU	12	16	002	04	121600204	Lister	509 (H-086)	05448	WBM4T20111001261
18	GUSHIEGU	12	16	002	05	121600205	Lister	509 (H-086)	05449	WBM4T20111000978
19	GUSHIEGU	12	16	003	00	121600300	Supervisor	509 (H-086)	05450	WBM4T20111000888
20	GUSHIEGU	12	16	003	01	121600301	Lister	509 (H-086)	05451	WBM4T20111001322
21	GUSHIEGU	12	16	003	02	121600302	Lister	509 (H-086)	05452	WBM4T20111001022
22	GUSHIEGU	12	16	003	03	121600303	Lister	509 (H-086)	05453	WBM4T20111001012
23	GUSHIEGU	12	16	003	04	121600304	Lister	509 (H-086)	05454	WBM4T20111001178
24	GUSHIEGU	12	16	003	05	121600305	Lister	509 (H-086)	05455	WBM4T20111001239
25	GUSHIEGU	12	16	003	06	121600306	Lister	509 (H-086)	05456	WBM4T20111000818
26	GUSHIEGU	12	16	003	07	121600307	Lister	510 (H-087)	05457	WBM4T20114000765
27	GUSHIEGU	12	16	004	00	121600400	Supervisor	510 (H-087)	05458	WBM4T20114000678
28	GUSHIEGU	12	16	004	01	121600401	Lister	510 (H-087)	05459	WBM4T20114000917
29	GUSHIEGU	12	16	004	02	121600402	Lister	510 (H-087)	05460	WBM4T20114000329
30	GUSHIEGU	12	16	004	03	121600403	Lister	510 (H-087)	05461	WBM4T20114000825
31	GUSHIEGU	12	16	004	04	121600404	Lister	510 (H-087)	05462	WBM4T20114000721
32	GUSHIEGU	12	16	004	05	121600405	Lister	510 (H-087)	05463	WBM4T20114000904
33	GUSHIEGU	12	16	004	06	121600406	Lister	510 (H-087)	05464	WBM4T20114000743
34	GUSHIEGU	12	16	004	07	121600407	Lister	510 (H-087)	05465	WBM4T20114000903
35	GUSHIEGU	12	16	004	08	121600408	Lister	510 (H-087)	05466	WBM4T20114000667
36	GUSHIEGU	12	16	005	00	121600500	Supervisor	510 (H-087)	05467	WBM4T20114000906

IT ASSETS QUALITY ASSURANCE (VALIDATION)

In 2021 Population and Housing Census, all IT assets to be used for training and fieldwork will be provisioned at HQ before distribution to the various districts within the country

- There will be a need for quality assurance to help with the execution of task as IT Support in order to ensure efficiency.
- Quality Assurance is a process of validating provisioned tablet to confirm the installation of all application software and all resources needed on the tablet.
- The process is necessary to prevent occurring challenges which might impede the functionality of the tablet in data collection process before, during training and after fieldwork.

Below is the checklist for quality assurance that every DIT must strictly observe:

Tablets;

- Confirm the total number of tablets and accessories (charger head and USB cable) assigned to the district
- Make sure all are Tagged
- All have been renamed according to their respective login IDs (Sup & Int.)
- Keep records of the status of tablets (cracked screen, touch defective etc.)
- SIM cards are inserted in all the tablets and there are data for syncing
- SD cards are well inserted in all the tablets and are functioning
- Ensure all SD cards are set to portable
- Ensure all can turn on and can be charged
- User manual and presentations slides are provisioned on all tablets
- Maps, interactive map and PHC2 are provisioned on the tablets
- CSEntry (v7.5.0) and Pdf reader are installed and can run correctly on all tablets
- Check if the right version (eg.v3.0) of 2021PHC CAPI Application is installed on all tablets

Power Banks;

- Confirm the quantity assigned to the district
- Can be powered on
- Can be charged
- Can charge tablet

Laptops;

- Confirm the quantity assigned to the district
- Ensure all can power on
- Chargers can charge the laptops
- MS Office, CSPro (v7.5.0) , Team viewer, SQLite(DB browser), Stata and Pdf reader are installed and can run correctly

IT ASSET DISTRIBUTION AND RETRIEVAL

During enumerators training and main fieldwork, trainees and field officers will be allocated IT assets in order to be trained and work effectively. Experience derived from trial census I and II shows that there is the need to standardize IT asset distribution across all the 272 Districts within the entire country. As part of the roles of the District IT Support officer (DIT), all IT assets are to be well distributed and retrieved at the end of training and field work exercise by adhering to the standard operating procedures in distributing and retrieving all IT asset. This process must follow a particular sequence at different stages to;

1. ensure standardization in the distribution and retrieval of all IT assets nationwide during the 2021 population and housing census.
2. Be able to track who receives what at a point in time.
3. Follow proper standard in reporting to management.

Stages of IT Asset Distribution and Retrieval

There are Two (2) stages of IT asset distribution and retrieval. The first stage will take place during the *field officers training* and the second stage will be for the *main fieldwork (Listing and enumeration)*

Phase One (1) - Field Officers Training Asset Distribution

Distribution of IT Asset during training

- Distribution will be done on the first day of Training across all the training centers with reference to the timetable
- The timelines for distribution will be between 9am-11am (2hrs) nationwide depending on the number of classrooms per district.

DIT will supervise all the distribution of IT assets to trainees by the facilitators

- The tablet and its accessories will be distributed simultaneously across the various classrooms within the training center.
- The DIT will hand over the total number of tablet required by each class to the facilitators for distribution.
- Asset distribution forms will also be handed over to the facilitators to track the allocation of the tablets and its accessories to various temporal teams formed in their classroom
- Based on the training team formation, the facilitator will assign the tablet
  - The DIT will follow up on the facilitators and validate the distribution.
  - Total number of tablets distributed will be verified
  - Number of surplus tablet after distribution will be verified
  - Signing of the asset receipt and return note

1. **Retrieval of IT Assets during training**

- All IT assets distributed during the training will be retrieved on the last day of field officers training
- All tablets and its accessories will be retrieved 4hours before the official closure of the training across all the training centers

Retrieval of all IT assets will follow the reverse process of the asset distribution

- Temporal supervisors will receive all IT assets from their members and hand over to their respective facilitators
- The facilitators will validate the status of the tablets and its accessories using the asset distribution form and clear the training teams.
- Facilitators will then handover all IT assets received from the training teams to the DIT
- The DIT will validate the status of all IT assets received with reference to the asset distribution and retrieval form and clear the facilitators accordingly based on the following;
  - Total number of tablets retrieved

- Number of Tablets cracked
- Number of defective tablets
- Number of lost tablets

PHASE TWO (2) - Main Fieldwork

1. **Distribution of IT Asset for the Main field work**

DIT will lead in the distribution of all IT assets to the qualified field officers with the support of the facilitators and other DDQMT

- The distribution will be done a day before the main fieldwork after completion of cleaning of the tablets
- The tablet and its accessories will be distributed simultaneously across the various training centers nationwide
- The timelines for distribution will be between 8am-12noon (4hrs) nationwide depending on the number of SAs per district.
- DIT and DDQMT will supervise the signing of the asset distribution and retrieval form by the various team members upon receipt of any IT asset
- DIT will also counter sign the asset distribution and retrieval form
- The following records will be taken and report to RIT / Management;
  - Total number of tablets distributed
  - Number of lost tablets
  - Total number of surplus (contingency) tablets
- The DIT will send the surplus *(contingency)* tablets to the warehouse for safe keeping and into LMIS
- RIT will validate the report received from the DIT and input it into the LMIS

2. **Retrieval of Distribution of IT Asset for the Main field work (Team Clearance)**

The DIT will lead in the retrieval of all IT assets from field officers with the support of DDQMT

- All IT assets will be retrieved after completion of field work by each team
- All IT assets distributed during main fieldwork will be retrieved after DDQMT clears the team(s)
- DITs with the support of the DDQMT are expected to retrieve all IT assets assigned, within three days after enumeration. However not

all teams will be able to complete work within stipulated time set for enumeration and therefore will wait till all teams on field are cleared.

- Supervisors will receive all IT assets from their team members and hand over to DIT for clearance
- DITs will validate the status of all IT assets received with reference to the asset distribution and retrieval form and clear the teams accordingly.
- DITs will back up the various teams data on the tablet
- The DIT will take daily records on the following indicators and report to RIT / Management;
    - Total number of teams completed and cleared
    - Total number of outstanding teams yet to be cleared
    - Total number of tablets retrieved by SA
    - Total number of outstanding tablets yet to be retrieved by SA
    - Number of Tablets cracked but working
    - Number of defective tablets
    - Number of lost tablets
- DIT will hand over all IT assets retrieved to the DCO
- Regional IT will follow up on the DDQMT to retrieve all IT assets allocated to the District at regional level

Distribution Checklist

As part of the preparation towards the distribution of tablets, District IT officers are to ensure that, the following check list are well followed:

- Date and Time are currently set
- All tablets has been renamed according to their respective login IDs (Sup & Int.)
- CSEntry, pdf and maps are installed and can run correctly
- User manuals, PHC2,
- Make sure all tablets are Tagged
- Sim and SD cards are well inserted
- Bluetooth, GPS and Data are all functioning

- Compare teams formation list to the original frame file
- Map SA and EA status to their respective tablet serial numbers (S/N)
- Ensure the availability of IT Asset distribution and retrieval form to be used to distribute the tablets
- Compare total number of team members with EAs under each SA

IT Asset Distribution and Retrieval Form

GHANA STATISTICAL SERVICE

INFORMATION AND COMMUNICATION TECHNOLOGY DIRECTORATE

2021 PHC TABLET ISSUANCE FORM

REGION: WESTERN NORTH			**DISTRICT:** AOWIN	**SA:** 23	1=RECEIVED 0=NONE						**TB=**Tablet, **CH=**Charger, **CA=**Case **PB=**Power Bank	
NO.	**ENUMERATOR ID**	**TABLET SN**	**ENUMERATOR NAME**	**CONTACT**	**TB**	**CH**	**CA**	**SIM**	**SD**	**PB**	**TABLET STATUS @ ISSUE**	**SIGNATURE**
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

Returned By:	**Received By:**
Signature:	**Signature:**
Date:	**Date:**

GHANA STATISTICAL SERVICE

INFORMATION AND COMMUNICATION TECHNOLOGY DIRECTORATE

2021 PHC IT ASSET RETRIEVAL FORM

REGION: WESTERN NORTH			**DISTRICT:** AOWIN	**SA:** 23	1=RECEIVED 0=NONE						**TB=**Tablet, **CH=**Charger, **CA=**Case **PB=**Power Bank	
NO.	**ENUMERATOR ID**	**TABLET SN**	**ENUMERATOR NAME**	**CONTACT**	**TB**	**CH**	**CA**	**SIM**	**SD**	**PB**	**TABLET STATUS @ RETRIEVAL**	**SIGNATURE**
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

Returned By:	**Received By:**
Signature:	**Signature:**
Date:	**Date:**

Undertaking:

NB: The officers will be held personally liable and accountable for any loss or damage caused to any devise or logistics under their custody

INSTALLATION OF SOFTWARE APPLICATIONS

Diagnosing and fixing of CAPI-based errors during 2021PHC data capturing requires relevant software and diagnostic tools. IT Support Officers will require essential knowledge and skills in the installation and use of these relevant tools to successfully support field officers. The applications are CSPro, CSEntry, DB Browser for SQLite and TeamViewer. These applications are used in troubleshooting errors encountered during fieldwork (onsite and remote)

Application Installation

CSPro Application

CSPro is the acronym for Census and Survey Processing System. It is used to ***create***, ***modify***, and ***process data*** using a single, integrated development environment (IDE).

It processes data on a case basis (one or more questionnaires), where a case can consist of one or more data records

CSPro Installation Process

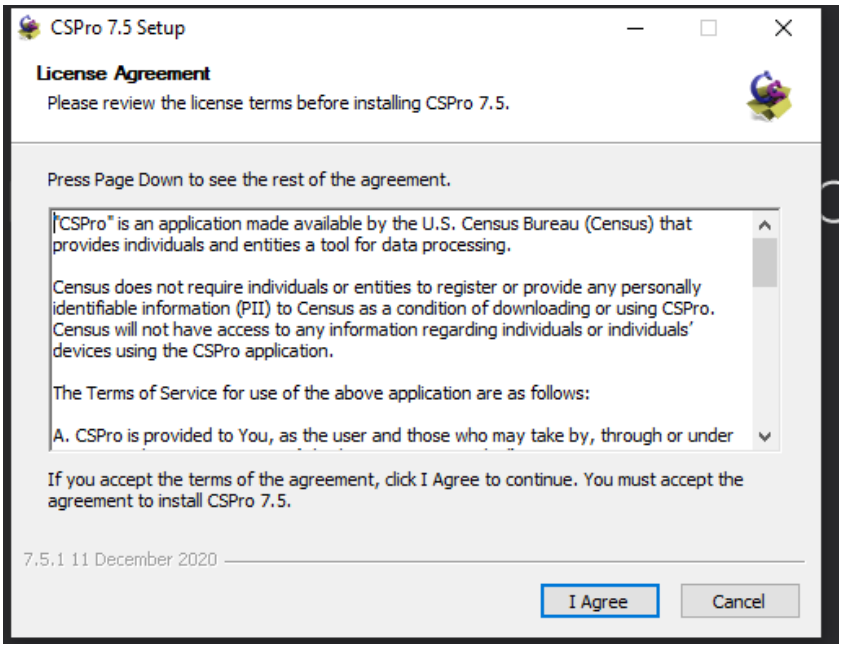
1. The **CSPro** installer has the file name *cspro7.5.exe*.

   To install CSPro:

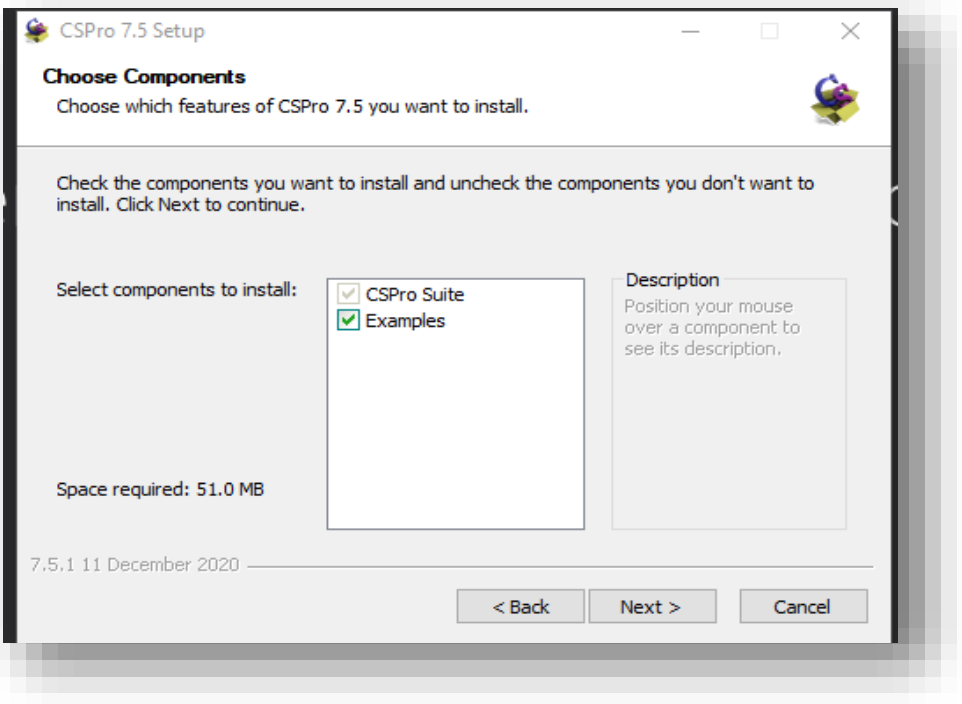
   • Locate the CSPro installer setup file

   • Double click on the file to install

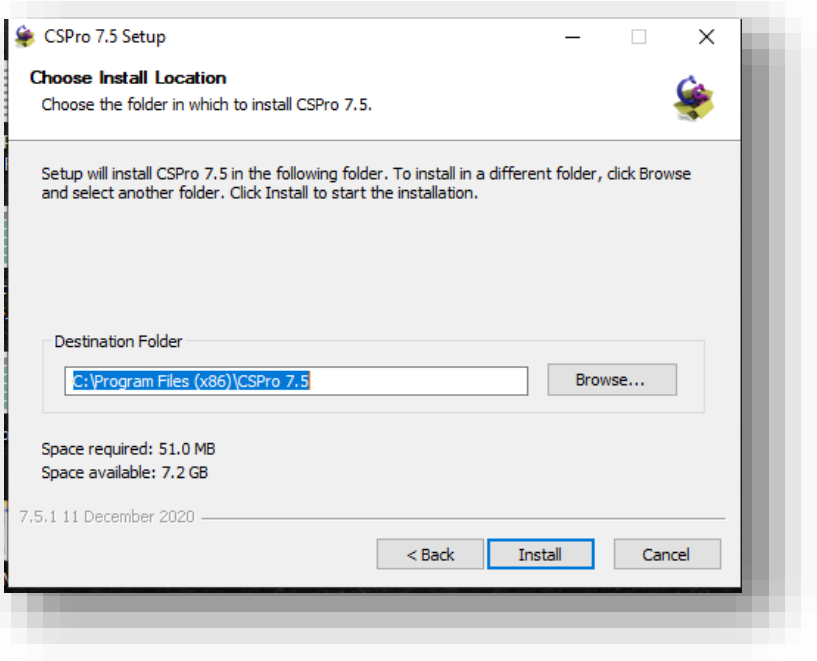
2. Read and accept the U.S Census Bureau's license Agreement



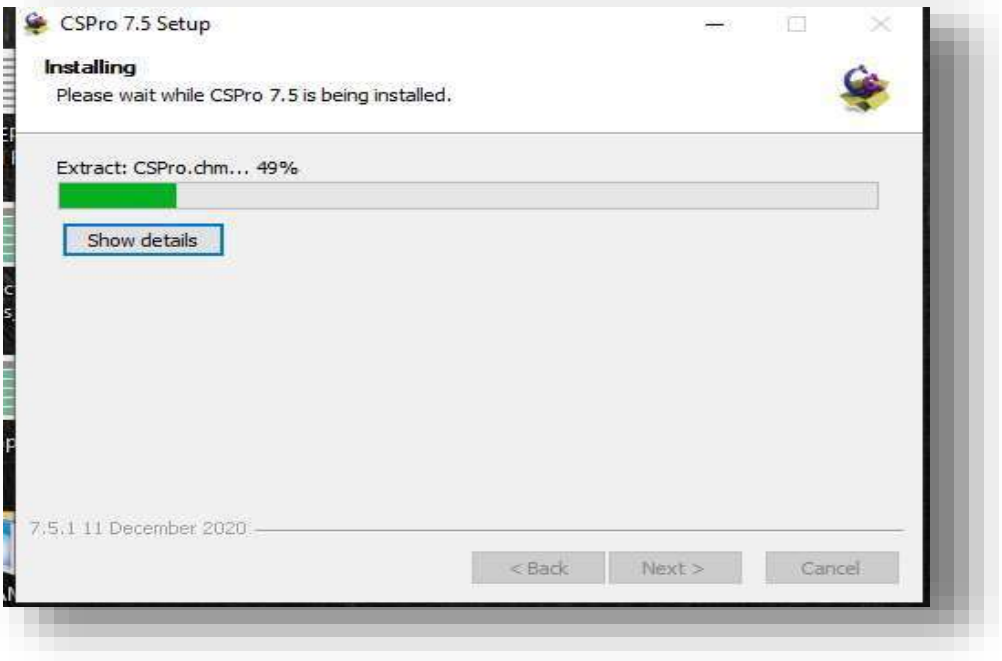
3. Select the components that you want to install.
   You will generally, want to install all of the Components.



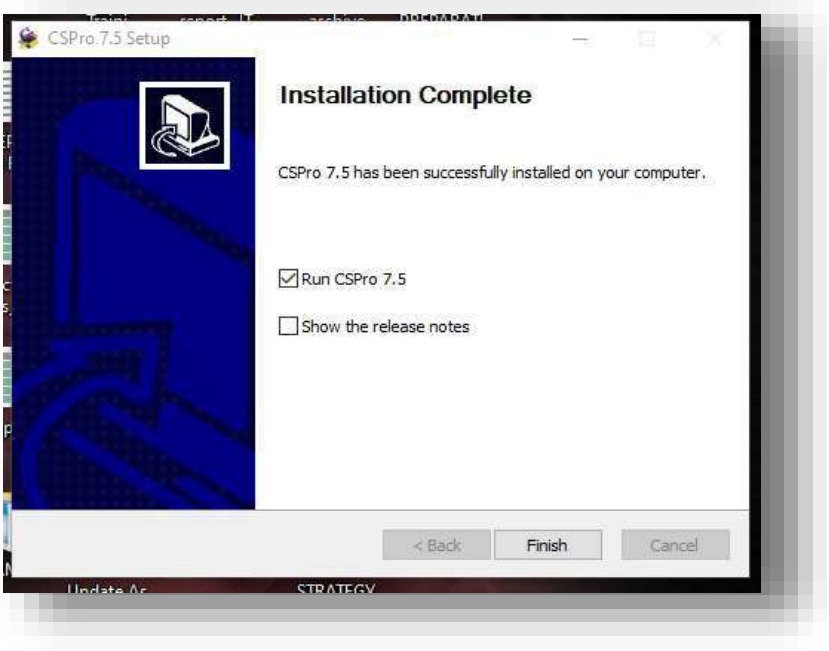
4. Select the folder where you want to
   install CSPro. You will generally want to install CSPro in the suggested directory



5. Installation Progress



6. This final screen shows that CSPro has successfully been install. You can click on '**Run CSPro 7.5' to start** or just click finish to complete installation



Over view of CSEntry

CSEntry is the Android version of CSPro

It is primarily used to collect data for census and surveys with a designed questionnaire using the Census and Survey Processing System (CSPro)

CSEntry is used for Computer Assisted Personal Interviewing (CAPI) on Android phones and tablets

Overview of DB Browser for SQLite (DB4S)

DB4S is a visual open-source tool used for creating, designing and editing database files compatible with SQLite

It is used to **create, search, design and edit databases**

DB4S allows you to view the sequence of commands you are executing before you run them

Uses of DB Browser (DB4S)

•Toview data stored in unreadable file formats

•Tomodify the data stored in an SQLite database

•Used for debugging

System Requirements for Installing Applications

The minimal system requirement for installing applications (CSPro, CSEntry, DB4S):

• 512 MB of RAM

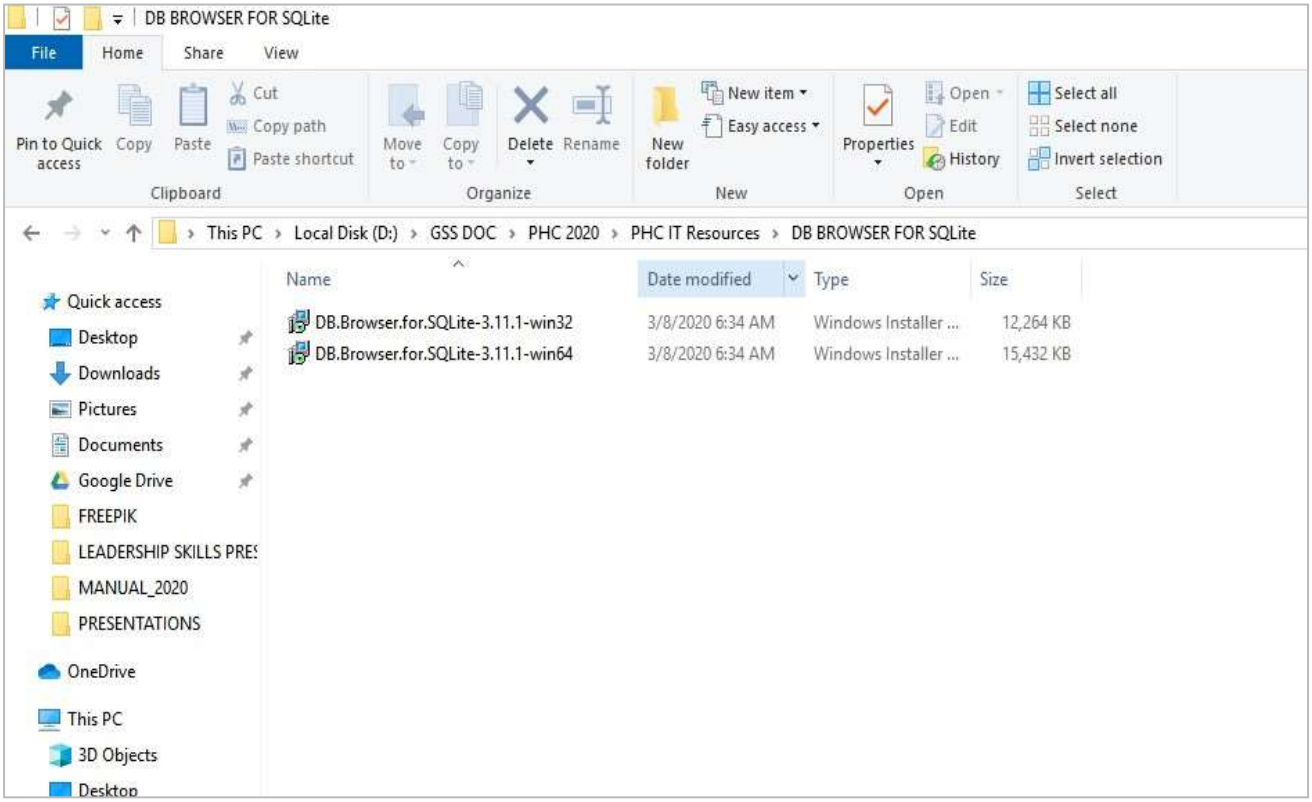
• 100 MB of Disk Space

• Microsoft Windows Vista, 7, 8, or 10

Installation of SQ4Lite for DB Browser

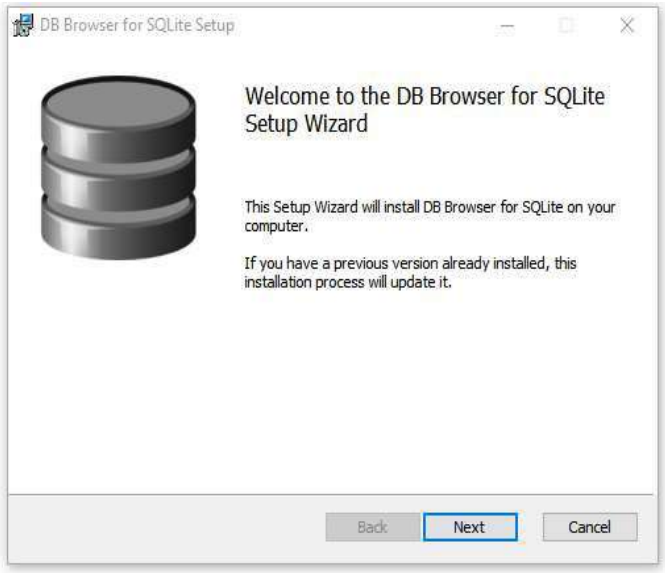
Download DB Browser from the website: *www.sqlitebrowser.org*

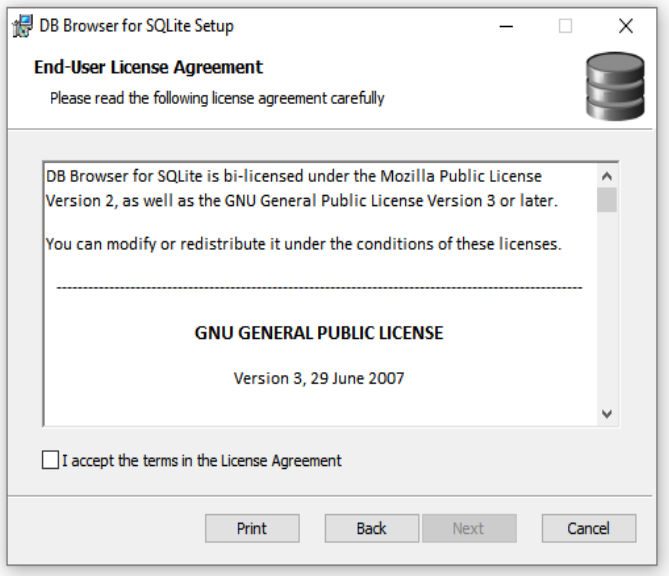
To get the DB browser for SQLite, just download the executable installer file from the project web page



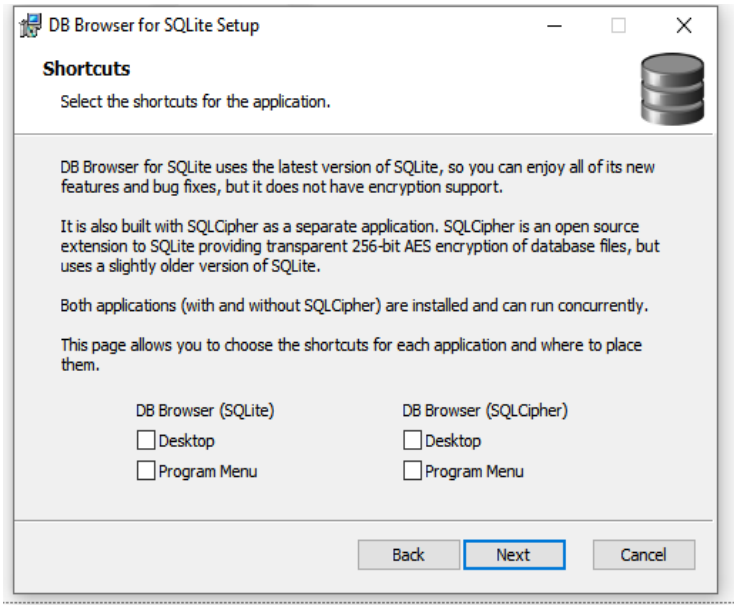
Locate and Open the SQLite installer folder

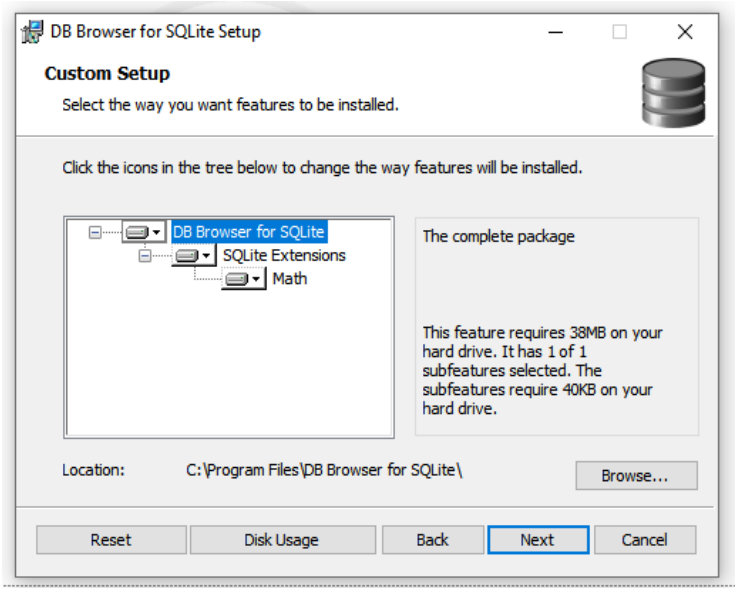
Double-click to install

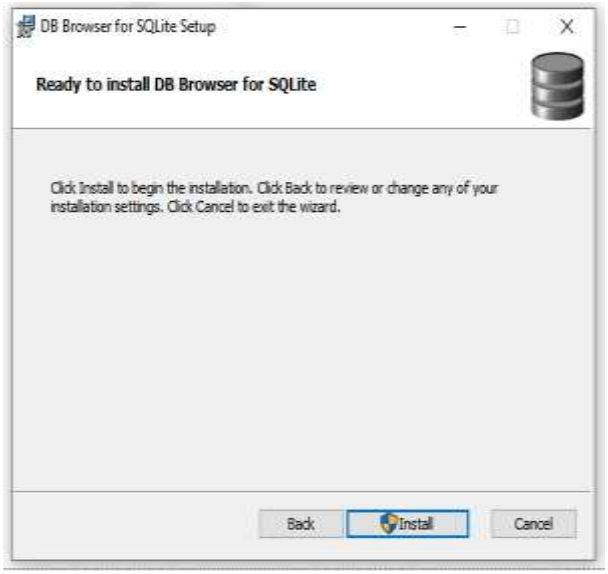


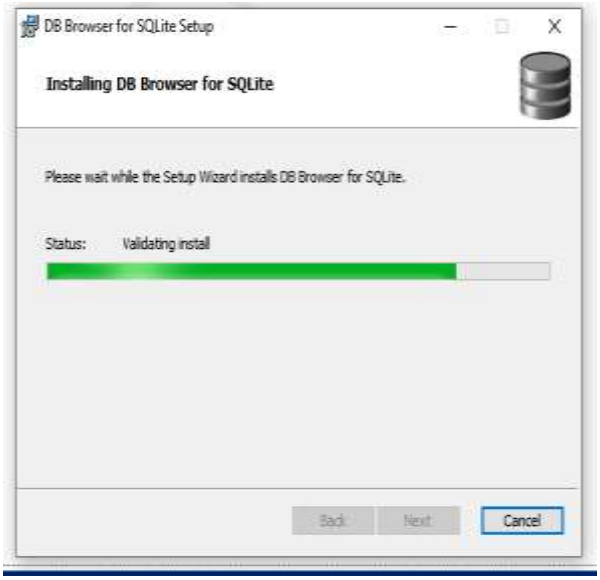


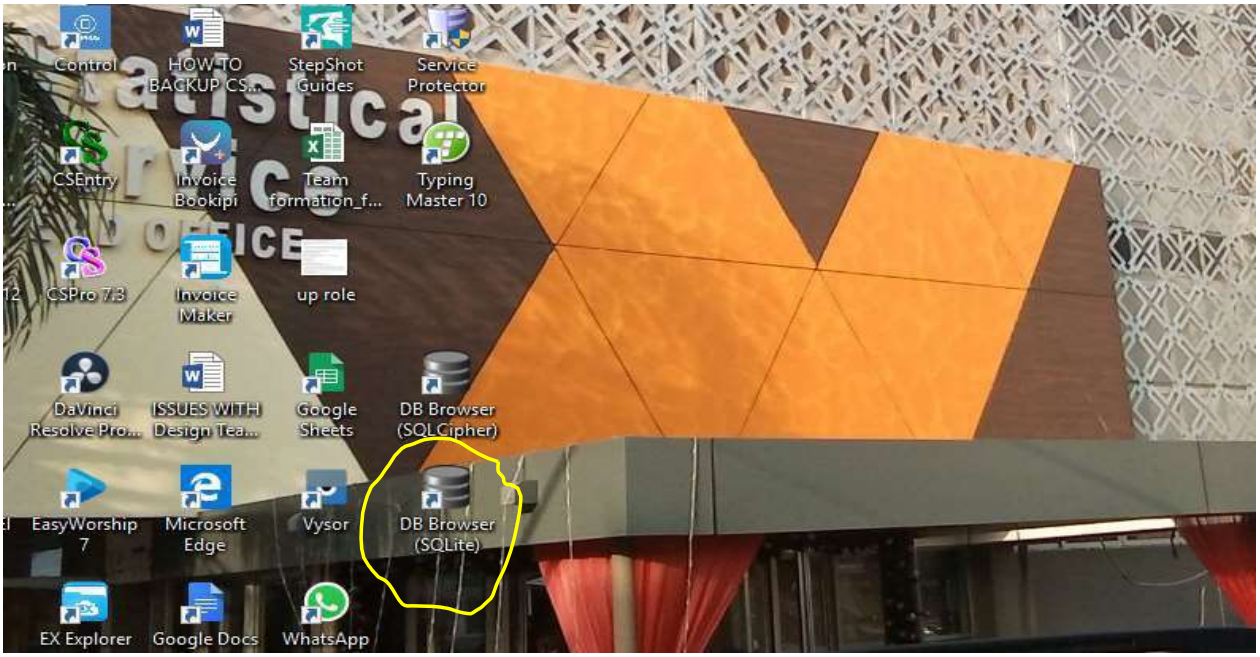
Installation Process –DB Browser



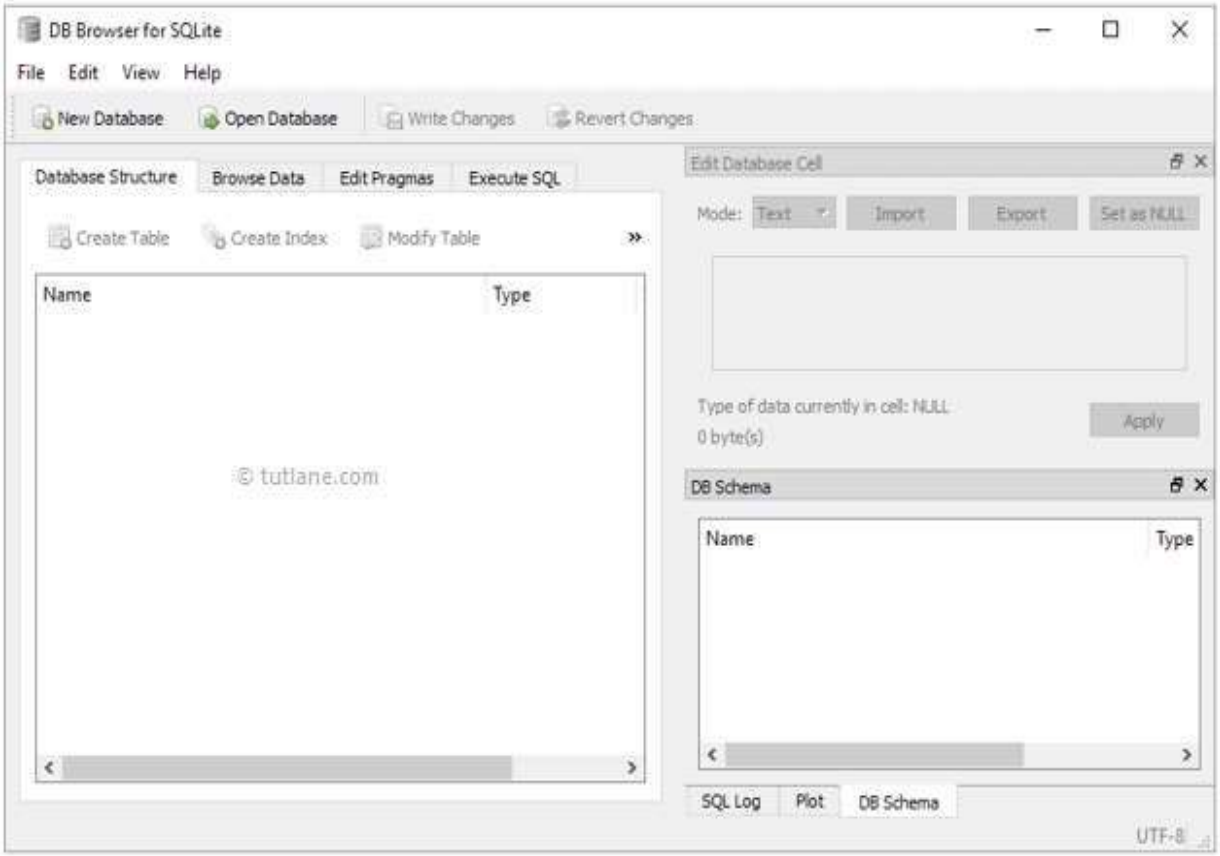



DB Browser for SQLite Setup
Ready to install DB Browser for SQLite
Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.
Back
Install
Cancel


DB Browser for SQLite Setup
Installing DB Browser for SQLite
Please wait while the Setup Wizard installs DB Browser for SQLite.
Status: Validating install
Back
Next
Cancel


Control
HOW TO BACKUP CS...
StepShot Guides
Service Protector
CSEntry
Invoice Bookipi
Team formation_f...
Typing Master 10
CSPro 7.3
Invoice Maker
up role
DaVinci Resolve Pro...
ISSUES WITH Design Tea...
Google Sheets
DB Browser (SQLCipher)
EasyWorship 7
Microsoft Edge
Vysor
DB Browser (SQLite)
EX Explorer
Google Docs
WhatsApp

DB4S Interface after installation



CHAPTER THREE: DURING TRAINING SUPPORT

TRAINING CENTER SETUP AND LOGISTICS

Training of enumerators and supervisors towards 2021 Population and Housing Census fieldwork, would be held at over 1500 training centers nationwide. This major activity requires adequate preparation prior to the training to ensure conducive environment. DDQMT members are required to ensure that all training centers have the needed facilities and logistics for the training.

Logistics needed for Training

- Projector and Screen
- Laptop
- Tablet
- Power Bank
- Extension Board
- Standby generator

Checklist for Training Center

DDQMT are to ensure:

- Availability of electricity and standby generator(s)
- Availability of working electrical sockets
- Adequate and working extension boards
- Availability of internet (turbo net/ MiFi)
- Availability of working projector with both VGA/HDMI
- Adequate chairs for trainees
- Walk ways between seats (behind & sideways)

Setting Up Classrooms for Training

- DDQMT must be at the training center at least an hour before training begins each day
- Setup projectors and screens before training begins
- Setup PA systems (speakers and microphones) if available

CAPI TRAINING REQUIREMENT

Identify storage facility for tablets

- **DDQMT** should ensure a well secured storage room to keep the tablets and other IT Assets safe

The size of the store room : The store room should be spacious enough so that when provisioning tablets it will be easy

Distribute Tablets: Distribute Tablets a day before CAPI Training for Charging and Check if all programs well provisioned

Mirror App: Test mirror software (e.g Apower, Vysor) on the laptop that will be used for training

Team sitting arrangement

To have a smooth CAPI training teams formed are required to sit together

Don't Sit, Walk Through To Assist

DIT/DDQMT must walk through class by class to assist facilitators during CAPI training

DDQMT must visit all class rooms to identify issues faced by facilitators and trainees and help resolve

TEAM FORMATION DURING TRAINING

- The success of the 2021 PHC data collection depends on the general preparedness of field officers and ability to execute their functions.

- For that reason, effort must be put into the formation of functional teams to ensure that the ultimate goal is achieved.

- The field officers will be put into teams comprising a Supervisor and a number of enumerators to work in an SA as part of the training.

- It is the role of DIT's to form teams for the training

Team Formation

Before team formation for each class, DIT's must;

- Find out the total number of trainees at the training center
- Find out the total number of trainees per class
- Obtain a Copy of the ENUM FILE

Filter ENUM FILE to find out the number of field officers in each SA

SA 1 6	SA 11..... 5	SA 21 4	SA 31..... 5
• SA 2 …… 5	SA 12..... 6	SA 22 6	SA 32 6
• SA 3 …… 5	SA 13..... 6	SA 23 6	SA 33 4
• SA 4 …… 6	SA 14..... 5	SA 24 5	SA 34 5
• SA 5 …… 6	SA 15..... 6	SA 25 6	SA 35 6
• SA 6 …… 5	SA 16..... 4	SA 26 5	SA 36 4
• SA 7 …… 5	SA 17..... 6	SA 27 5	SA 37 4
• SA 8 …… 6	SA 18..... 6	SA 28 5	SA 38..... 6
• SA 9 …… 5	SA 19..... 4	SA 29 6	SA 39..... 6
• SA 10 ……. 5	SA 20..... 5	SA 30 5	SA 40..... 4

Group SA's according to class size

CLASS A (40)	**CLASS B (39)**	**CLASS C (39)**
SA 1 6	SA 6.....5	SA 14 ……. 5
SA 2 …… 5	SA 7 …… 5	SA 15 …… 6
SA 3 …… 5	SA 9 …… 5	SA 17 …… 6
SA 4 …… 6	SA 10 ……. 5	SA 18 …… 6
SA 5 …… 6	SA 11..... 5	SA 20 …… 5
SA 8 6	SA 13..... 6	SA 22 …… 6
SA 12 ……. 6	SA 16..... 4	SA 24 …… 5
	SA 19..... 4	

CLASS D (38)	**CLASS E (38)**	**CLASS F (38)**	
SA 21 4	SA 28..... 5	SA 38..... 4	
SA 23 …… 6	SA 30 …… 5	SA 39 …… 6	
SA 25 …… 6	SA 31 …… 5	SA 40 …… 4	
SA 26 …… 5	SA 33 …… 4	SA 1..... 5	
SA 27 …… 5	SA 34 …… 5	SA 2..... 5	
SA 29 …… 6	SA 35 …… 6	SA 3..... 5	CONTIGENCIES
SA 32 6	SA 36..... 4	SA 4 5	
	SA 37..... 4	SA 5..... 4	

TABLET PREPARATION BEFORE FIELDWORK

Cleaning of the tablets is very essential before the start of main fieldwork hence, IT officers must pay particular attention to details in order to avoid training data merging with main field data

Concepts and Definitions

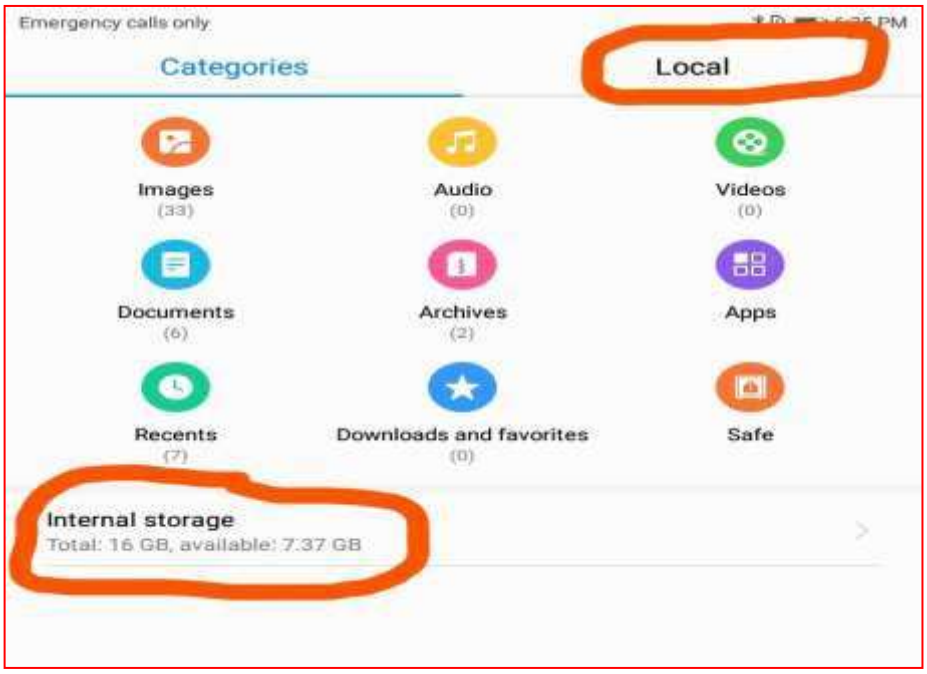
- **Training Data** : Data collected during the training of field officers
- **Fieldwork Data**: Data collected during the main fieldwork
- **Home Screen**: It is the start screen on a device or computer program
- **Backup Folder**: It is a folder which stores copies of data collected during fieldwork
- **Data Folder**: It is a folder which stores data collected during fieldwork
- **Cache**: It is a computer component that makes retrieving data from the computer's memory more efficient. **It acts as a temporary storage area** that the computer's processor can retrieve data from easily.
- **Storage**: It is a menu feature that enables a computer **to retain data, either temporarily or permanently**

Steps to Clean Tablet after training

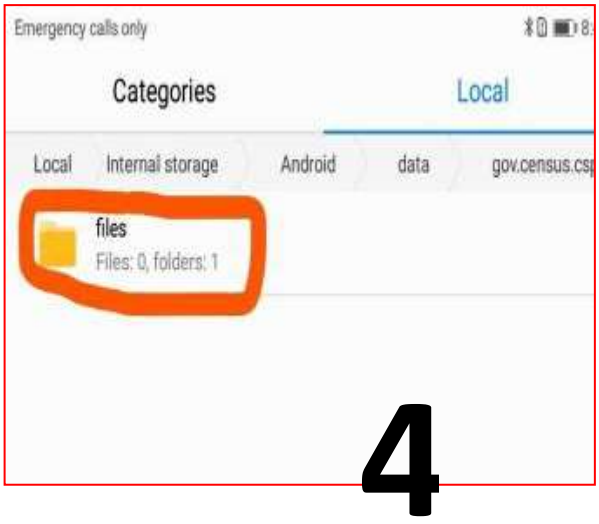
1. Switch on the tablet

2. Locate and open **My Files/File manager** from the home screen

3. Locate **local** and Select **Internal Storage**

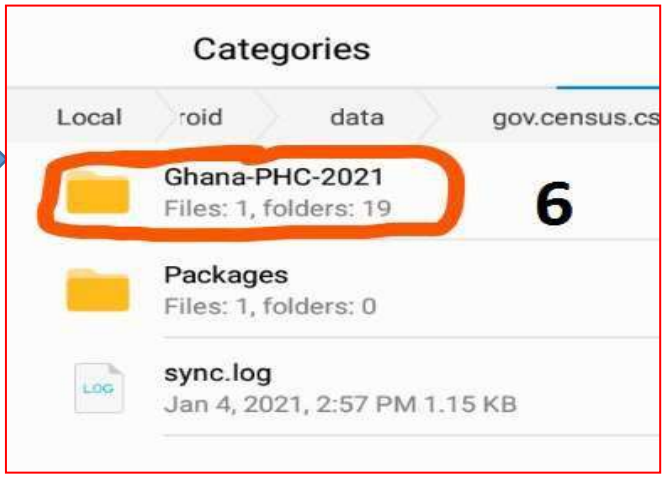


4. **Select Android Folder/data/gov.census.cspro.csentry/files**

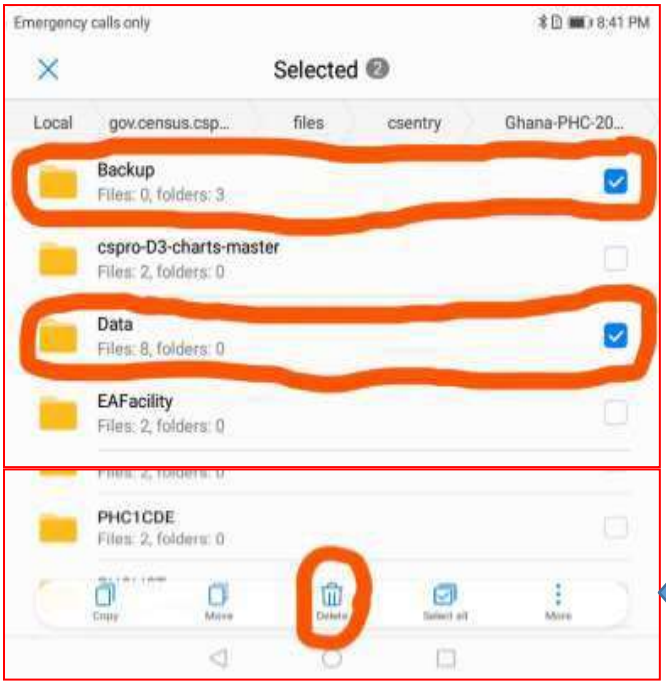


5. Select **CSEntry Folder**

6. Locate and select **GHANA – PHC – 2021 FOLDER**



7. Press and hold to select **Backup and Data folders**

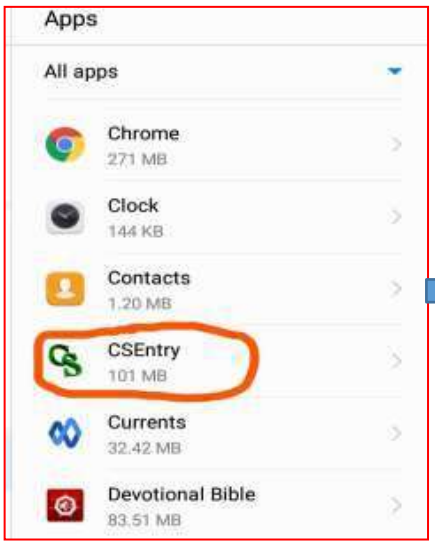


8. Select delete from the options displayed

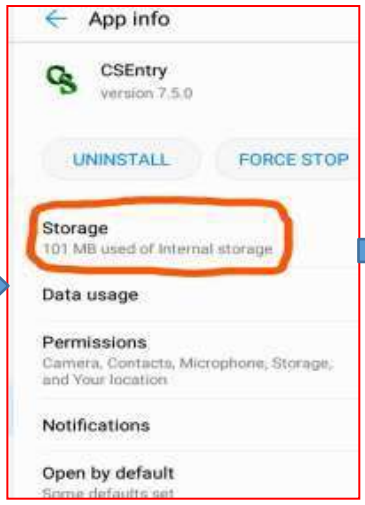
9. Return to the Home Screen, Locate and **Open settings**

10. Select **Apps** from the options displayed

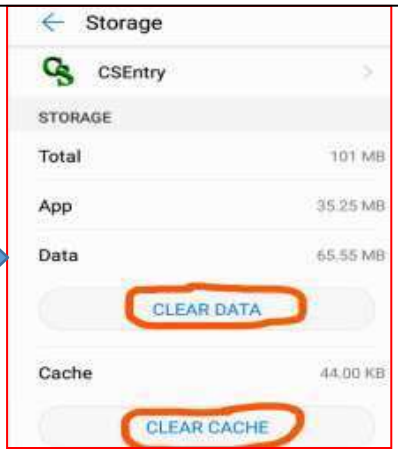
11. Select **CSEntry**



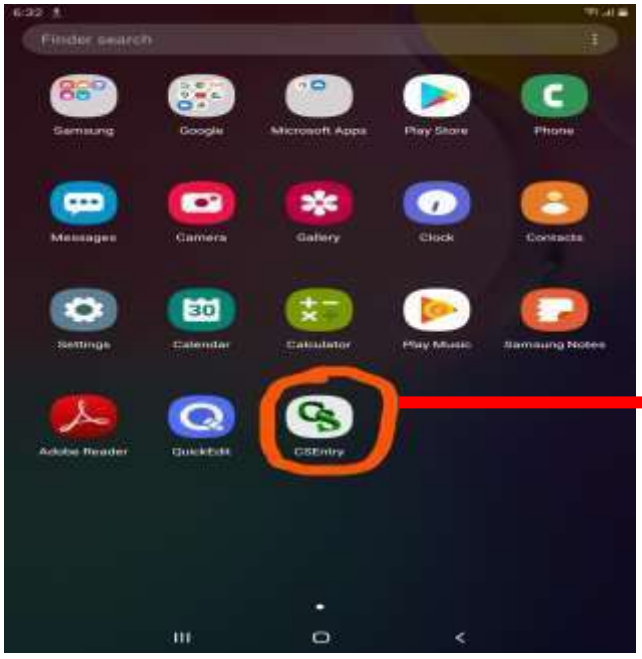
12. Select **Storage**



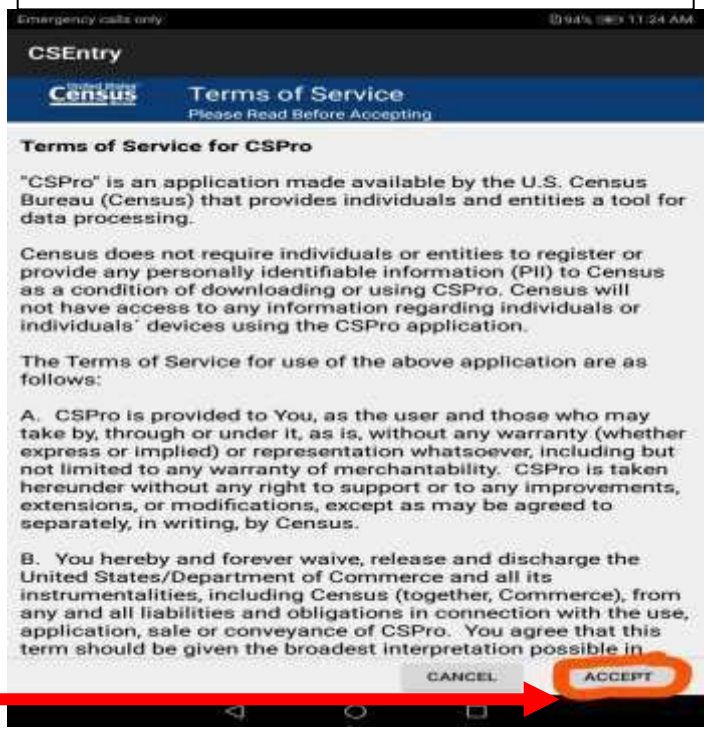
13. Clear **cache and**

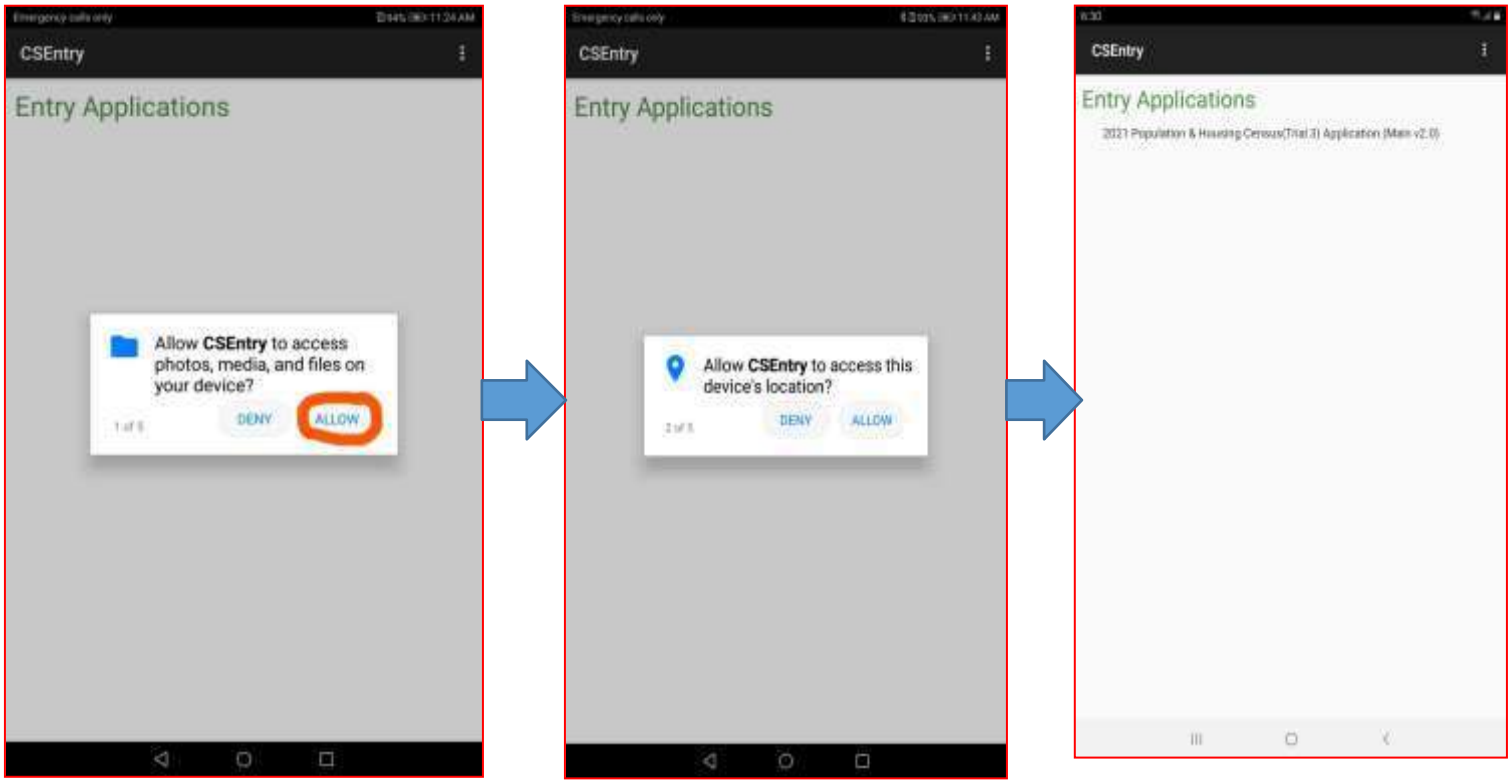


14. Return to **Home Screen** and **Launch CSEntry**



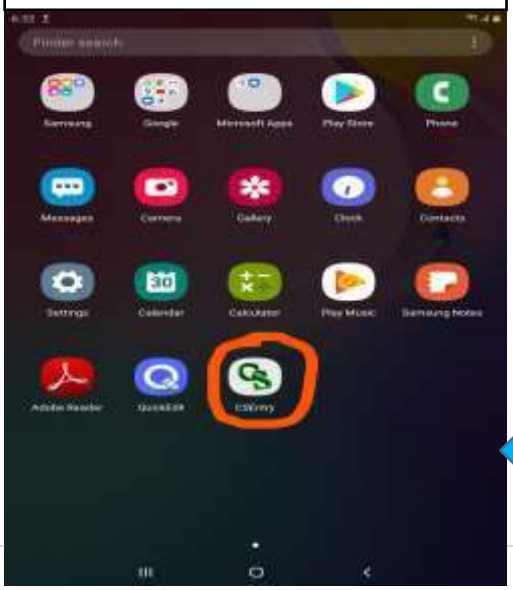
15. Accept terms and **policies**





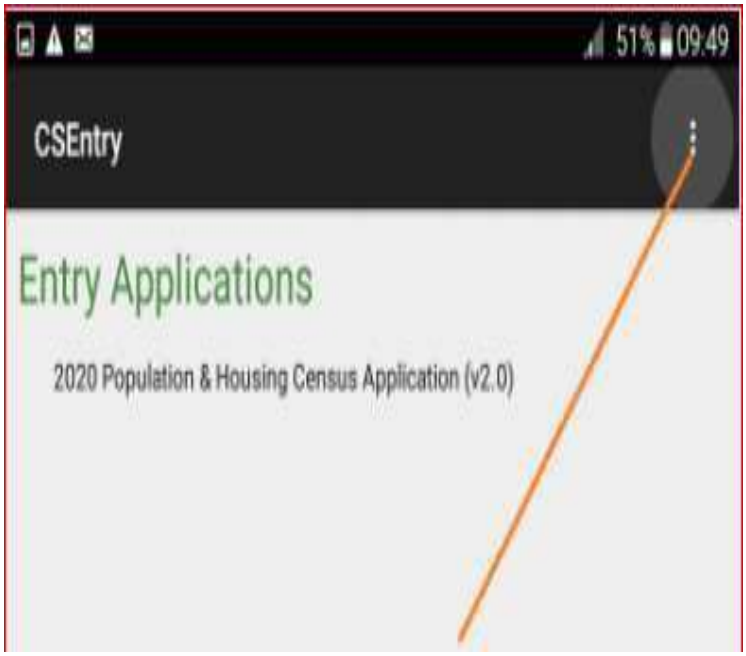
Steps to Add Application

1. Ensure that the tablet has the SIM card inserted with internet access or connected to the Wi-Fi

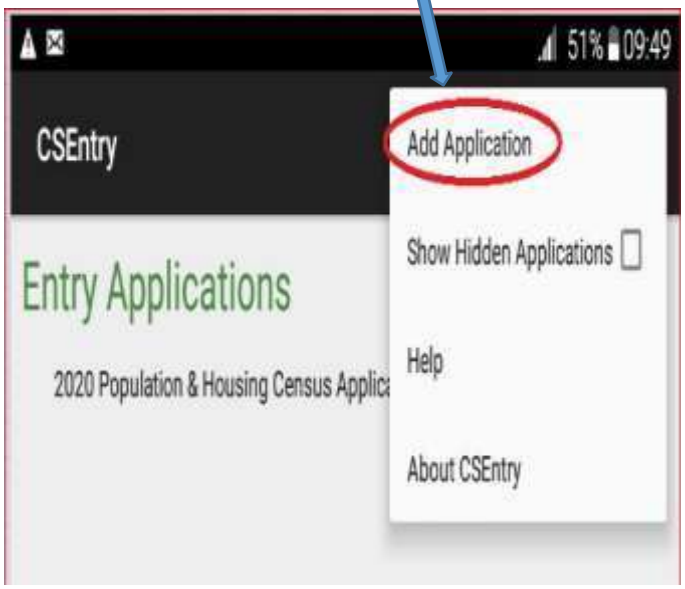


2. Launch the CSEntry Application for the 2021 PHC

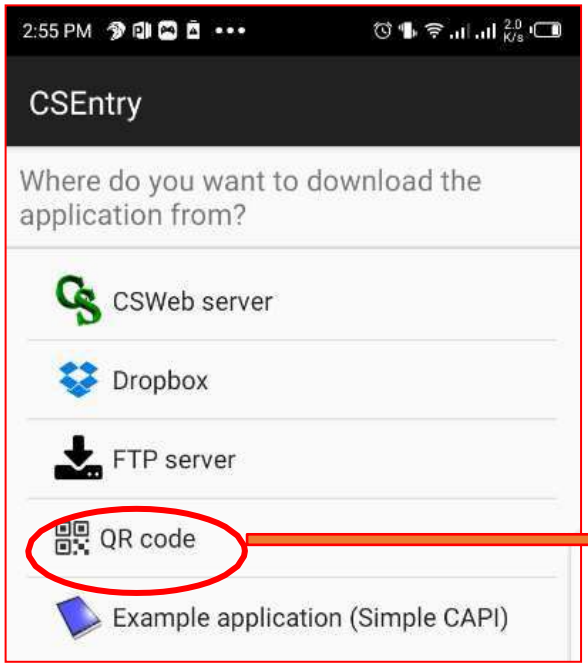
3. Tap on the three dots at the right hand corner on your screen to display the menu



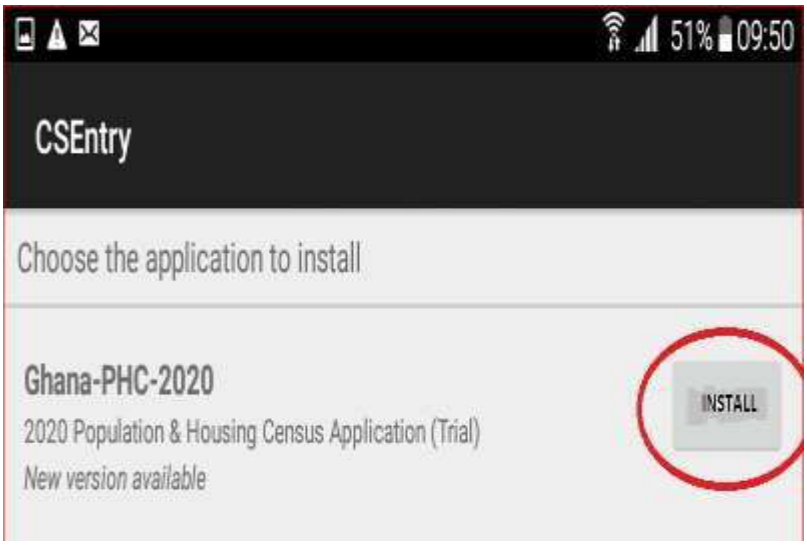
4. Choose Add Application

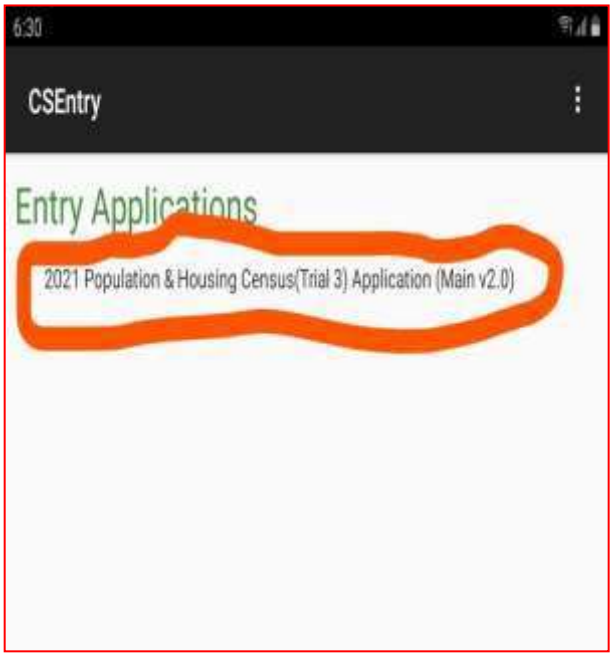


5. Choose the **QR code** and scan the **barcode**



6. After download, click on Install





CHAPTER FOUR: FIELD WORK SUPPORT (IT ROVER)

IT ROVER GUIDELINES

Considering the deployment of technological solutions towards the 2021 Population and Housing Census, which is being referred as "digital-census" or "e-census", IT **support services** are very necessary to ensure successful implementation. This is basically the process of offering assistance to all field officers and other members of the various work streams. However in other to meet the timelines of the 2021PHC fieldwork, the IT Support officer is required to play a rover role to ensure prompt support to the supervisors and enumerators.

"IT Rover" is the activity that requires the DIT to visit Enumerators and Supervisor during fieldwork in order to resolve all IT related issues within the District. This movement is needed in order to avoid interruptions of enumerators work when an IT issue arises and to ensure data quality.

The IT Support team is well positioned to cater for any other unforeseen circumstances that may occur during the 2021 data collection fieldwork and therefore this guidelines needs to be followed by the IT Rover to ensure professionalism, standardization at all levels

The duties of the IT rover has been breakdown into the following categories

The services of the IT rover will be performed in the following three major categories

1. Network Connectivity
2. Hardware
3. Software (CAPI app and OS)

NETWORK CONNECTIVITY

The two major aspect of the network connectivity that will require the IT Rover interventions are ***Bluetooth*** and ***Internet*** *connectivity*.

The Bluetooth allows the Enumerator to sync with the supervisor to transfer data whiles Internet connectivity allows both the Enumerator and Supervisor sync with the server to transfer data. Any hitch will affect *"Data Synchronization"* and thus delay the completion of the fieldwork on time.

Data Synchronization issues:

i. Supervisors and Enumerators are not able to transfer (sync) with the server due to lack of good internet connectivity

ii. Supervisors and Enumerators not able transfer (Sync) data to the server due to application bugs
iii. Enumerators are not able to sync Data with the Supervisor due to hardware related issue (Bluetooth defective, defective touch screen, cracked screen)

HARDWARE

This refers to the tablets and its accessories, power bank and solar chargers, tablet cases that will be used by the Enumerators and Supervisors for the 2021 Population and Housing Census fieldwork exercise. IT rover will be required to perform the functions in the following areas in dealing with hardware related issues.

Replacement of Tablet and its accessories

Replacement of tablet and other IT asset will be done based on the following factors

i. Missing IT assets (tablet & accessories, Power banks)
ii. Cracked Tablet screen
iii. Factory defects

Retrieval of Tablet and other logistics

i. Follow-up on supervisors and enumerators to retrieve all tablets and clear the team.

SOFTWARE (CAPI APP AND OS)

The software refers to the CSEntry, CAPI application and Android Operating System platform on which the CAPI is running. The IT rover will resolve software related issues in the following areas:

Data quality Assurance

i. Clear "foreign data" (Training Data*)*
ii. Resolve duplicates issues
iii. Resolve gaps in data collected

Software installation

i. Re-install CSEntry on the tablet
ii. Deploy fresh 2021 PHC CAPI application
iii. Install resources on tablet

Data Backup & Recovery

i. Backup of data
ii. Recover data from a cracked tablet
iii. Restore data

Tools/Logistics Required

1. Laptop
2. Tablet
3. Application (Rover App)
4. Pen drive (OTG)
5. Power bank
6. Internet Data
7. Backpack
8. Means of transportation

PROBLEMS AND SOLUTION

Data Synchronization

Rover App

1. Receive report from the DM that data from a particular EA/SA is not hitting the server
2. Confirm from SFS/Supervisors why their data is not hitting the server
3. DITs will be given tablets which have the Rover App installed on them to receive data from enumerators and supervisors.
4. Locate a place with strong internet connection and sync the data to HQ

Data Recovery

1. Receive report on data loss from enumerator/supervisor
2. Take a backup of the CSEntry folder onto a Laptop/OTG
3. Make another backup of the original data copied from the tablet on the laptop
4. Recover the data using SQLite(DB browser)
5. Copy the recovered data from the laptop to the tablet

Tablet Replacement

1. Check and make sure the date and time of the new tablet is correct
2. Check and make sure the 2020PHC application version is current
3. Take inventory of the new tablet to replace the old
4. Give the tablet to the enumerator/supervisor

USE OF CELL SITE MAP TO IDENTIFY NETWORK COVERAGE

Mobile network availability during digital census operation is essential in determining the success of data collection since the system requires a 3G network to determine the ability of the device to sync. On the other hand, the device uses location based system, to determine the position of the listing point. This analysis is to identify the dynamics of the determining good network coverage within the Ahafo region of Ghana which is characterized by dense forest cover.

The maximum distance between a device and a cell tower depends on connecting technology, landscape features, and the power of the transmitter in the tower, the size of the device network cell and the design capacity of the network. Cell tower transmitter signals are in a frequency range that travels in a straight line and have limited penetration capabilities and are sometimes set to low power so that it doesn't interfere with neighboring cells. Hills, trees, buildings, walls and tunnels may interfere with the signals. In urban areas, cellphones blocked from one cell tower may connect to another one nearby, but in rural areas, interference with coverage from a single cell tower may make reception unreliable.

Theoretically the range of standard cell tower may be up to 22miles (35.41 km) but in practice the range of the towers may just be 3–6 miles (5–10 km). Mobile devices on the other hand have the potential of reaching a cell tower 45 miles (72.42 km) away. The lowest maximum distance for good connectivity is about 22 miles (35.41 km) beyond which signal strength reduces. Another school of thought argues that the maximum distance should be 5-7 miles for voice and very slow data but for good connectivity the range must be between 1-2 miles. GSM/CDMA phone can reach 25 miles. In rural areas the tower's range is between 2 miles (3.2 km) up to 6 miles (9.6km). On the other hand in suburban areas the range is between 0.7 miles (1.1 km) to 2 miles (3.2 km) while in urban areas the tower's range between 100 meters to 500 meters. Based on the above mentioned and with the assumption that the angle of transmission of signal is 360^{o}, the radius of coverage can be classified as;

Good

- 2 miles radius from cell tower
- Expected to have excellent calls and data transfer on that network

Mid

- 6 miles radius from cell tower

- expected to have good calls with slow data transfer

Low

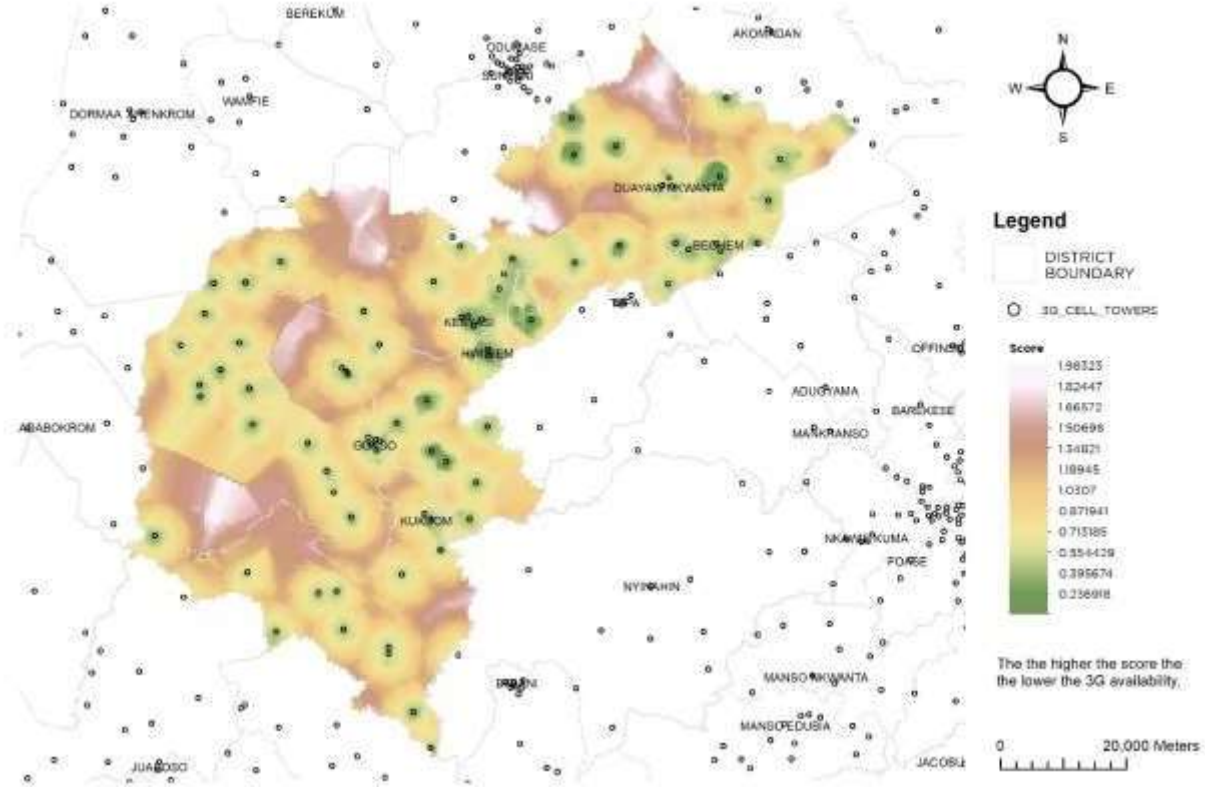
- 22 miles radius from cell tower

- expected to have calls with difficulty in data transfer.

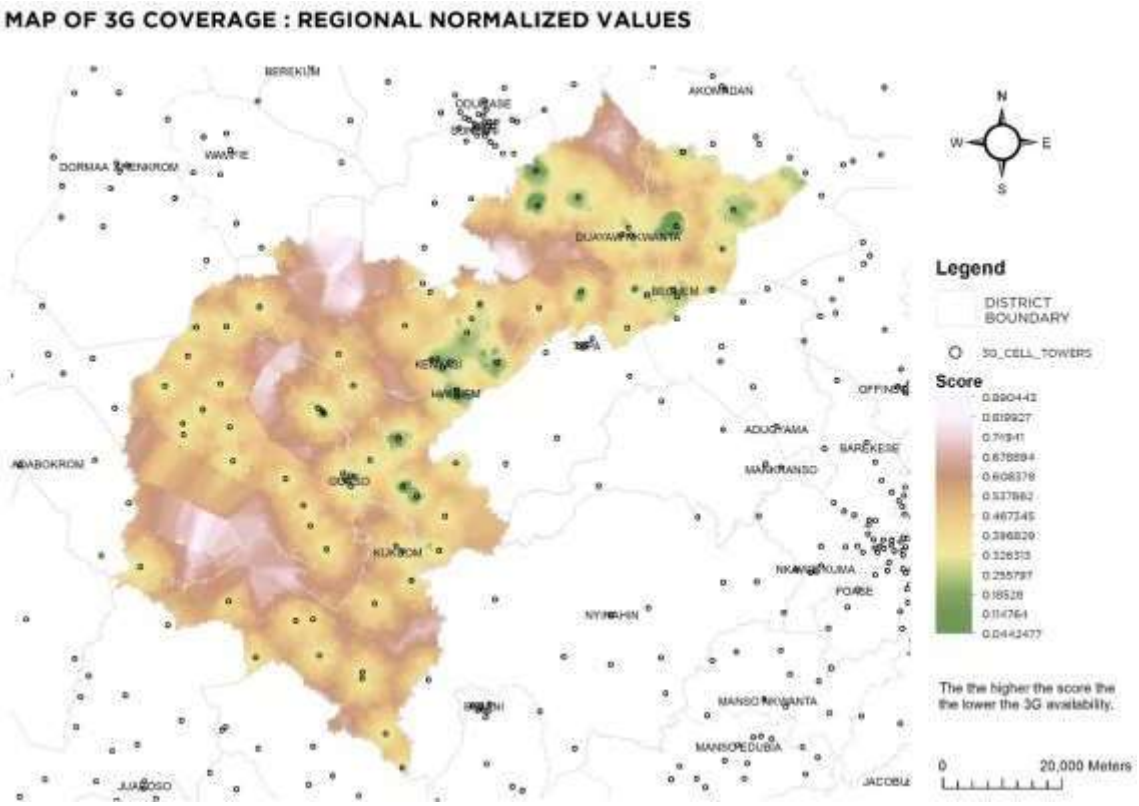
Methodology

The study used the near distance approach to calculate the distance of each town within the district from the nearest 3G tower in meters. The distance values were then divided by 3218.69 meters which is the estimated maximum distance from a tower for good connection. This generated a score which using IDW a coverage layer was generated for the district. The result in shown below: The second approach used to enhance the reliability of outcome of the analysis was to factor in the tree cover of each locality. Using these polygons generated using the Ghana Agric Census structure listing, the area of each locality was determined. With zonal statistics the score of tree cover was generated. This tree cover score was then added to the 3G network coverage score and divided by 2 to get a 3G tree score for the area. Using IDW the coverage map was generated. The result is shown below

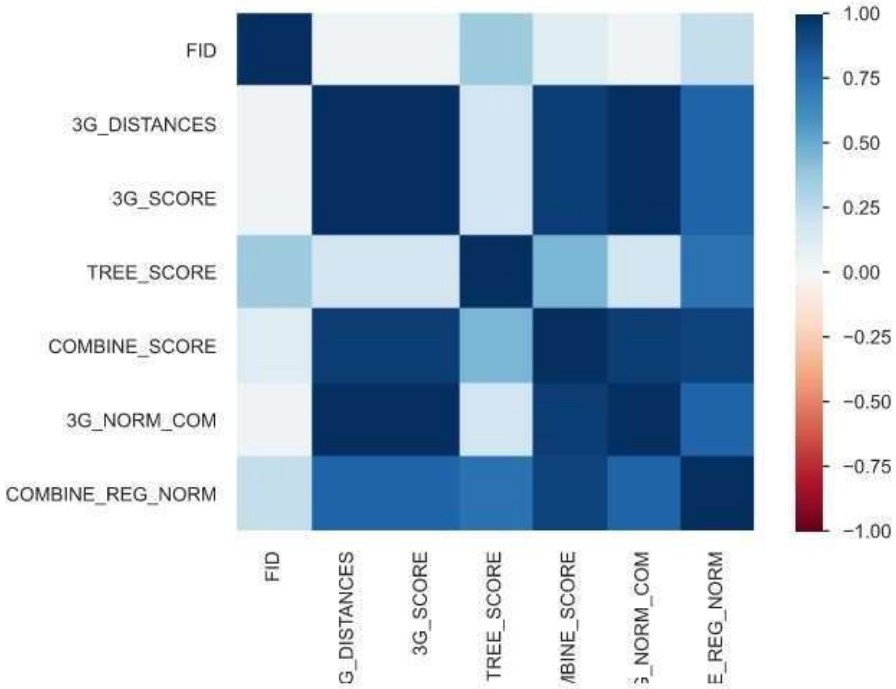
MAP OF 3G COVERAGE : COMBINE SCORE OF 3G AVAILABILITY AND TREE COVER

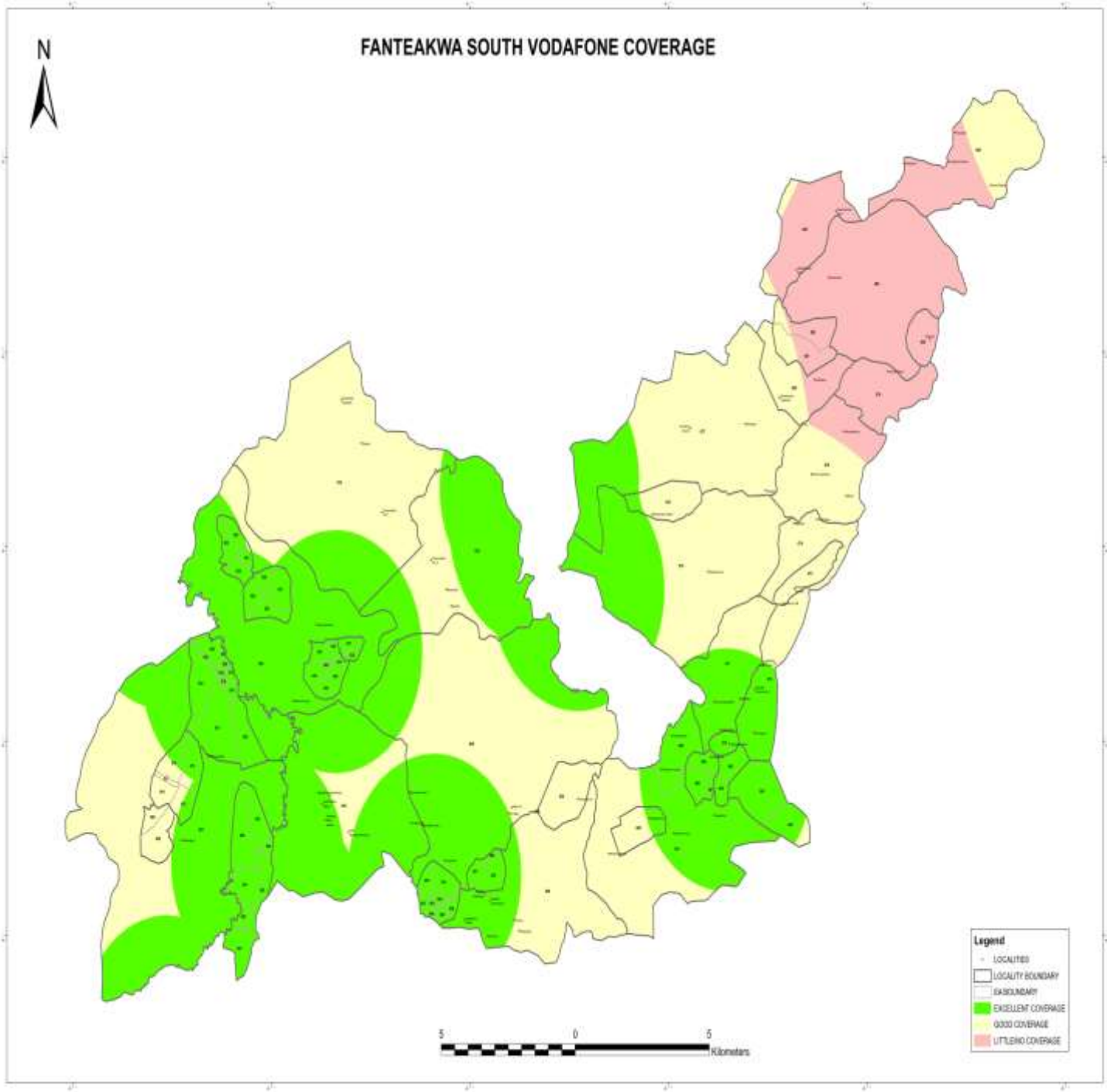


The final test was to normalize the value by the 3G score are a regional level before adding it to the tree score. This score was then run through the IDW interpolation to generate a coverage the map. The result is shown below.



Using Pearson's r it was identified there is a high correlation between the various score generated.




N
FANTEAKWA SOUTH VODAFONE COVERAGE
Legend
LOCALITIES
LOCALITY BOUNDARY
EA BOUNDARY
EXCELLENT COVERAGE
GOOD COVERAGE
LITTLE/NO COVERAGE
5
0
5
Kilometers

INCIDENT MANAGEMENT PLAN

The 2021 Population and Housing Census (PHC) is leveraging on IT to effectively conduct the listing and enumeration. Some of the essential tools being used are the tablet and the data entry application (CAPI). However these tools have their own adverse challenges where some of them are unforeseen. In order to curb these unforeseen challenges, there is the need to develop an Incident Management Plan. An **incident management plan** is a set of **procedures** and actions taken to respond to and resolve critical **Incidents,** how **they** are **detected** and **communicated**, who is responsible, what tools are used, severity of the incident and what steps are taken to resolve the **incident.** This document will help teams to return to normal as quickly as possible following an unplanned event. The incident management plan help us to:

1. Have a rapid, controlled, structured approach for managing major operational disruptions
2. Ensure specific key stakeholders are fully informed of the situation at all times
3. Ensure recovery and continuity field officers work at all times

For the 2021 PHC, the incident management plan has been summarized in the table below:

Event	Entities Affected	Potential Operational Loss	Potential Financial Loss	Support Team	EA Type	Severity Level			Minimum Time Required To Recover Operations	Resolution/Action by DIT
						Low	Medium	High		
Power Outage	SA (Team members)	Reduce the work rate in the SA	Financial loss to GSS	DIT/RIT DDQMT	N/A	Community Power Outage (No Electricity power to charge the tablet)			1-5hrs	1. Use power bank to charge tablet 2. Use Solar charger to charge tablet 3. Move to different nearby locality to charge tablets
	District Team (DDQMT)	Reduce the work rate in the District	Financial loss to GSS	RIT/ DDQMT	N/A	District Power Outage (No Electricity power in the entire District to charge the tablet)			1-10hrs	1. Use power bank 2.Use Solar charger to charge tablet 3. Move to a different nearby District to charge tablets DDQMT will charge contingency power banks to replace the affected teams power banks that has no power

Event	Entities Affected	Potential Operational Loss	Potential Financial Loss	Support Team	EA Type	Severity Level	Minimum Time Required To Recover Operations	Resolution/Action by DIT
						Low / Medium / High		
Broken Tablet Screen	District Team (DDQMT)	Reduce total number of functioning tablets in the district	Financial loss to GSS	DIT/RIT	N/A	When tablet is cracked and the touch screen not working	5-30mins	1. Record incidents and report to RIT/Management 2. Investigate 3. Ensure availability of contingency tablets to replace
						When tablet is cracked but the touch screen is working	5-10mins	1. Record incidents and report to RIT/Management
	SA (Team members)	Reduce the work rate in the Team(SA)	Financial loss to GSS	DIT	Type 3	When the touch screen is affected and unable to input data during main field work	3– 5hrs	1. Replace Tablet 2. Restore team's Data
						When the touch screen is affected but able to input data	N/A	1. Continue to use the same tablet. No replacement 2. Record incidents and report to RIT/Management
					Type 1 & 2	When the touch screen is affected and unable to input data during main field work	1– 2 hrs	1. Replace Tablet 2. Restore team's Data
						When the touch screen is affected but able to input data	N/A	1. Continue to use the same tablet. No replacement

Event	Entities Affected	Potential Operational Loss	Potential Financial Loss	Support Team	EA Type	Severity Level	Minimum Time Required To Recover Operations	Resolution/Action by DIT
						Low / Medium / High		
Loss of Tablet	District Team (DDQMT)	Reduce total number of available tablets in the district	Financial loss to GSS	DIT RIT INFRASTRUCTURE	N/A	Loss of tablet	8 hrs	1. File a police report 2. Report to RIT 3.Use MDM to track or reset tablet
	SA Team	Reduce the work rate in a District and SA	Financial loss to GSS	DIT	Type 3	Loss of tablet without syncing for the day	1-10 hrs	1. Report to RIT 2. Obtain a Police report from enumerator 3.Use MDM to track or reset tablet 4. Restore data 5. Replace tablet
					Type 1 & 2		1 – 3 hrs	
					Type 3	Loss of tablet after syncing for the day	6 hrs	
					Type 1 & 2		1 – 3 hrs	
					Type 3	Loss of tablet through theft	6 hrs	1. Report to RIT 2. Obtain a Police report from enumerator 3. Restore data 4. Replace tablet 5. Use MDM to track or reset tablet 6. Report to management
					Type 1 & 2		1 – 3 hrs	

Event	Entities Affected	Potential Operational Loss	Potential Financial Loss	Support Team	EA Type	Severity Level Low / Medium / High	Minimum Time Required To Recover Operations	Resolution/Action by DIT
Motor Accident	District Team (DDQMT)	Reduce support within the DDQMT team	Financial loss to GSS	RIT	N/A	Minor Injury	1 – 3 hrs	1. Report to RIT
						Major Injury, hospitalised	2 hrs – 6 hrs	1. Report to RIT 2. Obtain a Doctor's Report 3. RIT to replace Member with IRT if necessary
						Major Injury, no hospitalization		
						Loss of Life	24 hrs	1. File a police report 2. Obtain a Doctor's Report 3. RIT to replace member with IRT and report to management
	Field Officer	Reduce work rate among the team	Financial loss to GSS	DDQMT	Type 3	When the enumerator is involved in an accident and tablet screen is affected and cannot input data	1hr-10hr	1. Report incident to RIT 2. Replace tablet 3. Restore teams Data
					Type 1 & 2		1hr – 3hr	
					Type 1,2&3	When the enumerator is involved in an accident and tablet screen is cracked but can input data	4hrs	1. Report to RIT 2. The field officer should continue to use the tablet
					Type 1,2&3	When the enumerator is involved in an accident but the tablet is not affected	N/A	1. The field officer should continue to use the tablet

Event	Entities Affected	Potential Operational Loss	Potential Financial Loss	Support Team	EA Type	Severity Level Low / Medium / High	Minimum Time Required To Recover Operations	Resolution/Action by DIT
Sickness	District IT(DIT)	Reduce support within the DDQMT team	No Financial lost	DDQMT	N/A	When the DIT is sick and unable to perform his or her duties	1 – 3 hrs	1. Report to RIT 2. Replace Member if necessary
						When the DIT is indispose sick and able to perform his or her duties	N/A	1. Report to RIT 2. Continue with support activity
						Major Injury, no hospitalization		

ADVANCE TABLET (SETTINGS AND TROUBLESHOOTING)

WHAT IS A TABLET?

A tablet is a wireless portable personal computer with a touchscreen as a primary input/output interface. Tablets use android, windows or mac (iOS) operating systems. The 2021 PHC tablets use android operating system. However these tablets is typically smaller than a notebook computer, but larger than a smartphone

FEATURES OF A TABLET

TABLET ACCESSORIES

Charger

Android Cable

SD Card

Power Bank

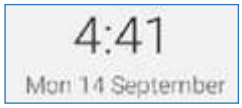
Key functions of the tablet which will be used during the 2021 PHC field data collection are:

Bluetooth

WiFi

Location (GPS)

Mobile Data (Hotspot)



Date and Time

Battery & Charging

Wi-Fi: Allows the tablet to connect to an external internet source. E.g. Hotspot tethering.

Bluetooth: Wireless function that connects one tablet to another within a short range (10 m).

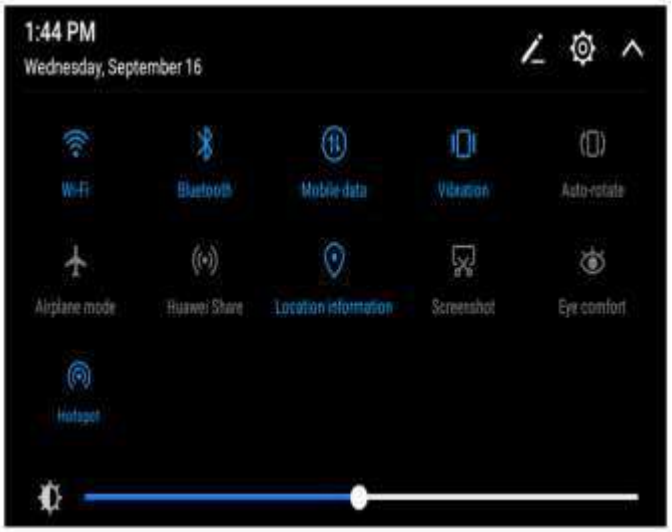
Location: Allows the tablet to read the GPS coordinates (Longitude, Latitude and Altitude) of structures. It also allows tracking of the tablet's location.

Mobile Data: Internal internet content delivered to the tablet over a SIM Card inserted into the tablet.

TABLET STATUS BAR

Samsung Status/Notification Bar

Huawei Status/Notification Bar



Setting the correct date and time on the tablet has great benefits for complete and accurate data collection which:

- Correctly determine periods or durations, including age;
- Helps to determine which questions relate to particular individuals in the household;
- Is used in combination with the location stamp, to identify the enumerator's location (itinerary) in the field
- Facilitates progressive/sequential data transfer from the enumerator's tablet to the supervisor or HQ server.

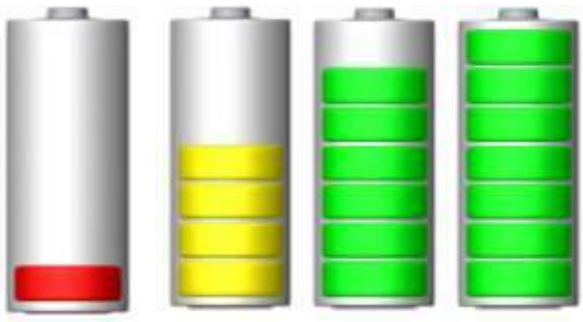
How to Set Date and Time Using the Huawei Tablet

- Setting **Huawei Tablet** Date and Time:
- Open **Settings**, go to **System** and look for **Date** and **Time**
- Open the **Date** and **Time** and enable **Automatic date & time** to sync the tablet's time and date with the mobile network or SIM (e.g. MTN) time. Otherwise, disable the **Automatic date & time** to set your time and date manually.
- **Modify time zone**: Under **System**, enable the **Automatic time zone** to sync the Tablet's time zone with the mobile network time zone. Alternatively, disable the **Automatic time zone** to set the time zone manually.

How to Set Date and Time Using the Samsung Tablet

- Setting **Samsung Tablet** Date and Time:
- From the home screen, tap Apps and tap on **Settings**. Or from the Status bar tap on Settings.
- Under **Settings** select the General tab.
- Under DEVICE MANAGER, tap **Date and time**.
- Clear the Automatic **date and time** check box.
- Tap **Set date**, select the **date**, then tap **Set**.
- Tap **Set time**, select the **time**, then tap **Set**.
- Tap on **Automatic time zone** to enable it sync with the mobile network time zone. Else, turn it off and tap on **Select time zone** to set it manually.

Battery Charging Indications



Check List before Fieldwork

- Battery is fully charged
- The tablet can be powered on
- There is a functional charger that can charge the tablet.
- Date and time are correct
- CSEntry & 2021 PHC CAPI Applications are installed and running

TROUBLESHOOTING TECHNIQUES

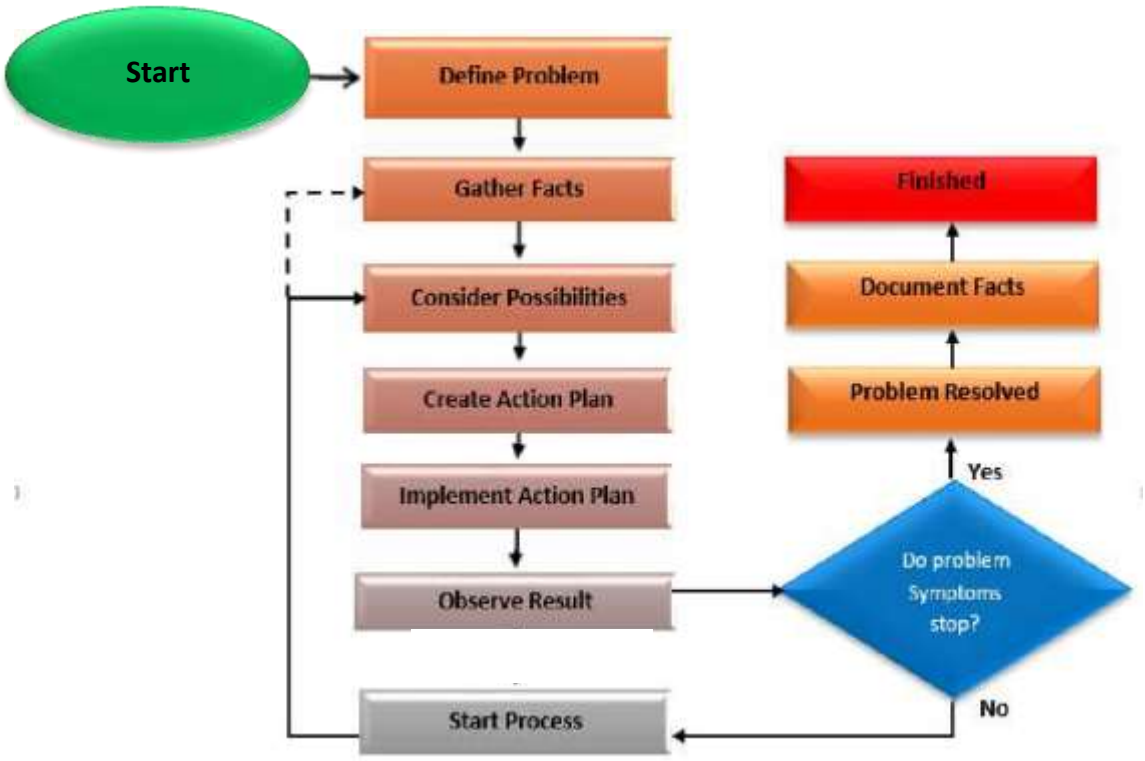
Troubleshooting is the act of following a procedure of identifying and fixing a problem or determining a problem to an issue. It's often involves the process of elimination, where a technician follows a set of steps to determine the problem or resolve the problem

Categories of troubleshooting in 2020PHC

There are two categories of troubleshooting:

- Hardware related (Tablet, Laptop, Projector, Printer, Network (Internet)
- Software related (CAPI App, Operating System, Office Application, Printer Drivers)

Steps to effective troubleshooting



Why people fail to solve problems effectively

The following is a list of some of the reasons why people fail to find effective solutions include

- Not being methodical
- Lack of commitment to solving the problem
- Misinterpreting the problem
- Lack of knowledge of the techniques and processes involved in problem solving
- Inability to use the techniques effectively
- Using a method inappropriate to the particular problem
- Insufficient or inaccurate information
- Inability to combine analytical and creative thinking
- Failure to ensure effective implementation

Troubleshooting Tools

- OTG Flash Drive
- Tablet
- Laptop
- Internet

POSSIBLE ERRORS/PROBLEMS

Problems arise when an obstacle prevents us reaching an objective

Eg. when a tablet breakdown during fieldwork (the obstacle) prevents the fulfillment of the assigned task (the objective)

Objective = something we have decided we need to achieve
Obstacle = anything that prevents us achieving an objective
objective + obstacle = PROBLEM

Display Problems / no display

1. Plug device directly into AC Charger. Within 10 to 15 minutes, a battery icon should appear if the device is powered off. Charge the battery for 12 hours.
2. If user reports device is charged, follow steps for lockup and hangs.
3. If no display after completing steps 1 & 2 above, unit should be sent for Service.

Unable to connect to the Internet

Make sure the Tablet is not in Airplane mode. (This is located in the Settings Menu under "Wireless and Networks".

Airplane Mode will disable all Wireless radios on the tablet.

For 3G Enabled Models:

If trying to make a 3G connection using a mobile data network, make sure the SIM card is installed

For Wi-Fi:

If trying to connect to a wireless network,

1. Check in the Settings for "Wireless and Networks" to make sure the Wireless is turned on.
2. Also check to make sure that the Wireless network you want to connect to is seen in the list of Wi-Fi Networks.
3. Wi-Fi Networks with security will show a small padlock next to the signal strength meter on the right side of the list.

Bluetooth not working

1. Make sure the "Bluetooth" radio is turned on in the "Wireless & networks" settings menu.
2. Make sure the device you are trying to connect to is set to discoverable.
3. Go into the "Bluetooth Settings" and choose "Find Nearby devices".
4. Then press "Scan for devices".

If the device is found then it should prompt you to enter a PIN number to pair the device.

Unable to make a connection to your Computer

1. Make sure you are using the USB cable that came with the tablet,
2. Connect to the Micro USB port on the tablet.
3. The tablet should appear in your "My Computer" Screen.

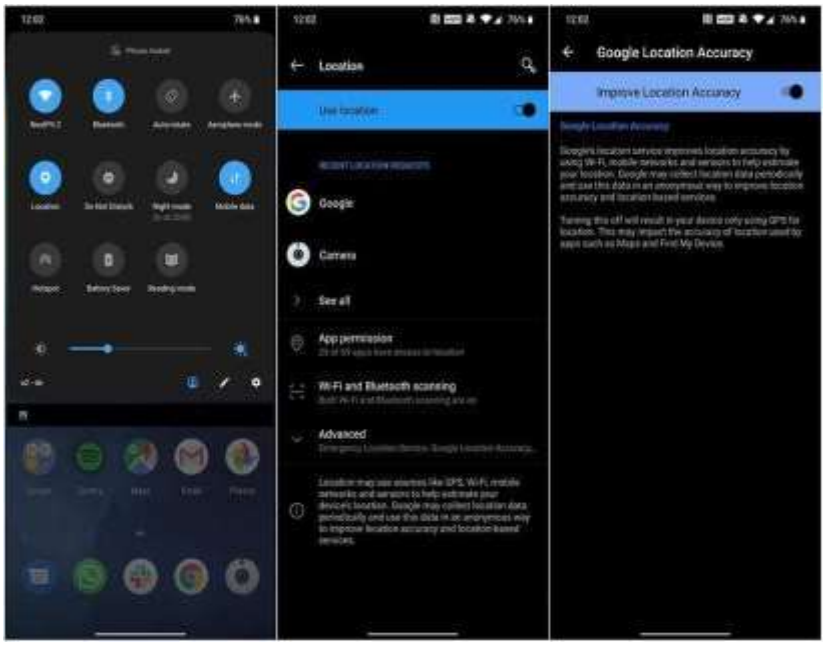
The Screen does not rotate

Go into the Android settings to the Screen choice and enable "Auto rotate screen", or press the Auto Rotate button on the front of the device.

GPS Accuracy level more than 5.0m

Switch on Google Location Accuracy (Solution 1)

1. To get the best possible signal, you have to be prepared to use a bit more battery than normal. It's a necessary sacrifice, and you can always reverse it later when you don't need to use GPS anymore. Enabling this is easy; just follow a couple of steps and you'll be on your way.
2. Go into your Settings and tap Location
3. Ensure that your location services are on. You should also be able to enable it from the quick toggles when pulling down the notification bar.
4. Under Location you need to go to Advanced and then Google Location Accuracy.



Clear Cache and **Data for Maps to fix GPS issues (Solution 2)**

1. Go to the Settings menu of your phone or tablet
2. Scroll down to find Application Manager and tap on it
3. Under the Downloaded Apps tab, look for Maps and tap on it
4. Now tap on Clear Cache and confirm it on the pop up box.
5. Once the cache files are cleared, tap on Clear Data.

CHAPTER FIVE: FIELD WORK FINALIZATION

CLEARANCE OF FIELD OFFICERS

During 2021 PHC, IT Assets will be used for training and main fieldwork. As part of IT support Officers clearance procedure, all IT assets distributed to field officers will be retrieved at the end of training and main fieldwork

Procedures for clearance of field officers cover **four** dimensions at three 4levels:

- Dimensions

1. Completeness of coverage of structures, of content (population and housing characteristics) households/institutions/floating population in all EAs within the SA and localities in Type 3 EAs
2. Completeness and accuracy
3. Submission of data from the field (in the form of synced data and tablet backup)
4. Retrieval of returnable materials/items :

LIST OF IT ASSETS TO BE DISTRIBUTED AND RETRIEVED

- Tablet
  - ✓ SIM Card
  - ✓ SD Card
  - ✓ Tablet Case
  - ✓ Charger Head and USB Cable
- Laptop
- Charger
- Power Bank
- USB cable
- Solar Charger

LEVELS OF CLEARANCE

There are three levels of clearance:

1. First level – Supervisors and Enumerators clearance by DIT during training and field work
2. Second DIT clearance by RIT after field work
3. Third RIT clearance by NIT after retrieval of all IT Assets within the District

FIRST LEVEL CLEARANCE BY DIT

At the district level, there are two stages of clearance;

- **Training**: This is the process where DIT clears potential supervisors/enumerators by retrieving all IT assets distributed after field practice.

Steps To Clear Teams After Training

1. Take copies of all asset distribution and retrieval form from the supervisors
2. Retrieve all the tablets in teams as distributed
3. Validates the total number of tablets and accessories retrieved
4. Check for the size of SD cards of each tablet

- **Field work**: This is the process where DIT clears supervisors/enumerators by retrieving all IT assets distributed after main fieldwork. A team is cleared when the DDQMT confirms that the work in each EA under the SA is completed and DM at HQ has certified the completeness and quality of the data

  This confirmation is done by the DDQMT based on the following checklist

  1. **All structures** in the EAs have been listed and reflected in the database.
  2. All structures with **household and non-household population** have been correctly enumerated.
  3. All data for the EAs assigned to a team have **NO**:
     i. Duplicates,
     ii. Gaps
     iii. Partial saves
  4. Total household and non-household populations identified during listing have been accounted for during the main enumeration
  5. Total number of EAs assigned to the SA/Team have been listed, enumerated and accounted for
  6. Total number of localities expected for each Type3 EA have been accounted for
  7. All **inconsistencies and errors** identified have been resolved for every enumerator in the team

8. All tablets and accessories assigned to the team have been accounted for and are in good condition:
9. Individuals shall be held accountable for any item assigned to them on a case by case basis
10. Retrieval of field materials:
11. The DIT Officer shall make a back-up of all the tablets assigned to teams/SA and reconcile them with those of the Data Monitor
12. The DCO will lead DDQMT to collect all returnable materials/items.
13. DDQMT will compile the list of all teams that have passed all the criteria and send a copy to the RS/RDM for collation and onward processing at HQ

SECOND LEVEL OF CLEARANCE BY RIT

The procedures below are to be followed before DITs' clearance;

1. Ensure all IT assets distributed to the districts within the Region are accounted for by the DITs
2. Validate all IT asset received from the districts
3. Receive report from DITs in the required format
4. Ensure DITs backup all data for their respective Districts and uploaded to the cloud
5. All IT Assets within the District are transported to the Regional/HQ

THIRD LEVEL OF CLEARANCE BY NIT

This is a stage where the National IT (IT Support Coordinator clears all the RITs

1. Ensure and validate all IT assets distributed to the Regions within the country are accounted for by the RITs
2. Receive report from RITs in the required format

2021 PHC FIELD DATA BACKUP

Backup refers to making copies of the original data generated by the Enumerators and Supervisors during field work. This will help to restore the original data at the event of any data lost. Backups are extremely important for data management. It is not a question of if you will lose data sometime, it is a question of when that will happen.

What to Copy?

Due to the huge file size of the entire **CSEntry** folder, the DIT is required to back-up only the **DATA and Paradata Folder** located within the CSEntry folder on the tablet.

Tools required

1. Laptop
2. Tablet
3. Android USB Cable
4. OTG flash Drive

Checklist for 2021 PHC Field Data Backup

1. Ensure there if are enough power in both the laptop and the tablet
2. Ensure the Android cable is functioning well before use
3. Create the required folders 🗁 to keep the team's (SA) data files
4. Backup one SA at a time
5. Ensure not mixed two or three different SAs tablets when doing backup
6. Ensure the safety of the tablet at all times esp. when there are a lot of people around
7. Pay attention to details during

STANDARD FOLDER NAMING CONVERSION

ONE: Create a mother folder on a laptop for the district with the folder name

Example:

1. **C:\2021 PHC_FANTEAKWA SOUTH DATA BACKUP**
2. **C:\2021 PHC_TEMA WEST MUNICIPAL DATA BACKUP**

TWO: Create a Subfolders within the District Folder for all the SAs within the district

Example:

1. **C:\2021 PHC_FANTEAKWA SOUTH DATA BACKUP\SA_01**
2. **C:\2021 PHC_FANTEAKWA SOUTH DATA BACKUP\SA_02**
3. **C:\2021 PHC_FANTEAKWA SOUTH DATA BACKUP\SA_03 etc…..**

THREE: Within the SA folder, create subfolders for all supervisors and enumerators. Name the folders according to their respective EA code underscore supervisor's/enumerator's name Example 1

1. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\SUP_NANA DEBRAH (For supervisor)**
2. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA001_MICHAEL OTIBU (For Enumerator)**
3. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA001_GRACE OWUSU_02 (Support Enumerator)**
4. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA001_COURAGE KPODO_03 (Support Enumerator)**
5.

Example 2

1. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_02\SUPDATA_RICHMOND YEBOAH (For supervisor)**
2. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA002_PRISCILLA YARTEY (For Enumerator)**
3. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA002_DANIEL ASARE_01 (For Enumerator)**
4. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA002_SAMUEL MAMFE_02 (Support Enumerator)**

Example 3

1. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_02\SUPDATA_CELESTINE OWUSU (For supervisor)**
2. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA002_EMMANUEL**

BENEFO_01 (For Enumerator)

3. **C:\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\EA002_ANITA ASIGE_02 (Support Enumerator)**

FOUR:

Copy the "Data" folder from the Tablet and paste it in the folder created on the Laptop Copy the "Paradata" from the Tablet and paste it in the folder created on the Laptop

Final Data Backup Folder

\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\SUPDATA_NANA DEBRAH\Data

\2021 PHC_FANTEAKWA DATA BACKUP\SA_01\SUPDATA_NANA DEBRAH\Paradata

STEPS TO BACKUP

Method One Using cable

1. Connect the tablet to the laptop using the USB cable
2. Allow MTP for file transfer
3. Open the tablets internal storage on the laptop
4. Locate Android\Data\gov.census.cspro.csentry\file\CSEntry folder\Ghana-PHC-2021\Data and **Paradata**
5. Copy and Paste the Data and **Paradata** folder from the tablet to supervisor's /enumerator's folder

*****Repeat action till all supervisor's/enumerator's data are backed up*** Method Two- Using OTG Pen drive**

1. Connect OTG to laptop
2. Copy supervisor's/enumerator's folder created on the laptop to the OTG drive
3. Connect OTG to tablet
4. Open file manager on the tablet
5. Open the tablets internal storage
6. Locate Android\Data\gov.census.cspro.csentry\file\CSEntry folder\Ghana-PHC-2021\Data and Paradata
7. Copy and Paste the Data and Paradata folder from the tablet to supervisor's /enumerator's folder

8. Connect the OTG with the backup data to the laptop and paste

*****Repeat action till all supervisor's/enumerator's data are backed up*****

	CHALLENGES	HOW IT WAS RESOLVED	REMARKS
1.	TR1 Listing cases disapp**ea**r on enumerators *Capi* due to wrong entry of ***EA****-code* provided by their supervisors	Tested and found out that when you entered an EA-code incorrectly you would not be able to get your cases out after finalizing. Listing data was split using DB browser (SQLite) and wrong EA_code was changed to the correctly assigned EA_code to restore their cases.	It should be well communicated to supervisors to avoid entering wrong EA codes. The CAPI team should check to ensure that supervisors do the right thing.
2.	TR2 "*Error message*" popping up in the middle of syncing when it got to (*GHA_**EA**_FACILITY_DICT*). This happened between supervisors and enumerators, preventing data from being synced between enumerators and supervisors	Took backup and deleted *EA_FACILITY.csdb* file on the supervisors' tablets, added application and synced again.	The CAPI team should check this problem to prevent it from happening in the future
3.	TR1 and TR2 Some tablets were unable to take GPS	Calibration was done and issue was resolved.	
4.	TR2 Some interviewers were using wrong login IDs (training IDs),making their work not reflect in the census Database	Restored using DB browser (SQLite)	Login IDs for practice should be created during training and rather avoid using login IDs for field work during practices.
5.	GNHR(Northern Region) Listers Data cases deleted when synced with supervisor	Restored data cases using DB browser and added application to correct errors	The Capi/IT team should always test the application before deploying to avoid such instances.
6.	GNHR(North East) MTN **SIM** cards were not registered.	DIT rovers instead resolved the issue using their personal hotspot/manual syncing with Cspro data viewer. With the issue of unregistered MTN SIM cards, some were	All SIM cards should be registered and provided with enough data before the start of work.

	Vodafone **SIM** cards had no data on it while others could not use it within certain location	replaced with the Vodafone SIM cards. Vodafone data bundle came very late which wasn't sufficient	
7.	GNHR(North East) Most listers made the mistake of not switching user at the start of work in a new **EA** thereby resulting in lots of duplicates. In some instances, some listers had to redo the entire work in a particular **EA**	Supervisors were educated on how duplicates are generated, types of duplicates and ways to resolve them	Most facilitators had less knowledge about the use of CAPI so delivery was a challenge. Facilitators should be trained on how to change EAs using the application.
8.	GNHR(North East) The tablet could not be distributed to trainees due to the lack of standard group formation Trainees from two different districts were mixed up inst**ea**d of classified according to Districts	Distribution of tablets was postponed to the next day	It is advised that under no circumstance should two districts be mixed up during a training session
9.	GNHR(North East) The mixed up of Districts cr**ea**ted a lot of issues in the retrieval process and that caused a huge mixed-up in the tablets allocated to **each D**istrict		It is advised that under no circumstance should two districts be mixed up during a training session
10.	TC and GNHR Time given to **DIT**'s to prepare tablets for field practice and main field work not enough	Sleepless night should be observed by the DIT to be able prepare tablets these two activities	Ample time should be giving for DIT's to be able to prepare tablets very well and also check for other inconsistencies e.g date, time etc.
11.	GNHR Office spaces given to **DIT**'s to prepare tablets not conducive, because they are shared with other facilitators which is not encouraging as far as tablets preparations are concerned	We managed with the facilitators to occupy the same office space to be prepare tablets though is not encouraging	An office space should be assigned solely to DIT's for preparation of tablets without any distraction or interference
12.	GNHR Cases deleted on tablets after synchronization between supervisor's tablets and the central server	1. The DB browser (SQLite) software is used to restore the deleted cases on the affected tablets. 2. Copy and replace the listing file in the data folder in the CSEntry application and sync HQ	Syncing path should tested over and over again before start of main field work

13.	TC1 Some cases are synced but does not reflect on server	1.Check for the right server path 2. Identify those cases and step through and finalize and sync for the second time 3.Check for internet signal strength	Supervisors should informed about these troubleshooting skills
14.	GNHR(Northern Region) Since trainees were introduced to cleaning of tablet for field work as directed by HQ, some listers tend to delete cases when they have issues instead of consulting DIT	DIT had to resort to backup folder on either the listers/supervisors tablet to restore deleted cases. Alternatively use DB browser to restore deleted cases.	
15.	**GNHR(Northern Region)** The inte**ractive and description maps were** placed in wrong folders **in the CSEntry** application	Both interactive and description maps were copied and placed in their correct folders	Provisioning of the tablets should be rechecked after all required apps are installed
16.	**TC1** **No data bundle were provided for the IT Support for troubleshooting**	Using own money to fund during the entire life of the filed work exercise	Data bundle should be provided to enhance IT Support work
17.	**TC and GNHR** No means of transportation for IT rover and this impedes quick response to technical issues.	Vehicle/motor bike were hired to do follow up on those who were having challenges with their tablet and the application itself and at same time carrying some tablets from one point to another posing a higher risk on the IT Support. All transportation cost were personally funded	Vehicles should be provided to all IT Officers
18.	TC and GNHR No Contract/Appointment letters were given to DIT officers	The DIT managed to work without Contract	Contract/Appointment letters should officially be given to DIT officers in subsequent projects.

20.	TC and GNHR No ID cards were given to DIT	DIT worked without ID cards	ID cards should be provided
21.	GNHR Late payment delays DIT work because some listers refuse to submit tablets after fieldwork	DIT had to convince listers for them to bring tablets	Payment should be done on time as stated in the contract
22.	GNHR Delay in team formation resulted in delay in tablets distribution during training and after training	DIT had to wait for the final team formation list	Team formation list should be given to DITs a day before tablet distribution
23	Listers renamed the tablet's Bluetooth name to their names	DIT had to rename the tablets to the original Bluetooth name	