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| --- | --- | --- | --- | --- | --- | --- |
| **Process** | **System Roles** | | | | | |
| **Human** | **Non-Computing**  **Hardware** | **Computing**  **Hardware** | **Software** | **Database** | **Communication**  **& Network** |
| **Data Entry** | **A. Weather station/ Research organizations & NGOs/ City Corporation**  1. Collect information from weather monitoring devices (WMD)  2. Save a copy of the data (.CSV file and physical).  3. Send weather data (.CSV file) to the system directly using a form.  **B. Drivers around the city** 1. Data is collected when these people drive around the city with their car through a WMD connected. Both weather and data location data is sent to the system. | **A. Data Sheet in**  **Printed Version**  1. Physical copy of data sheet is also kept as backup.  **B. File Holder**  1. Data sheets are kept in organised file holders  **C. Cabinets**  1. The files are kept in the cabinets | **A. Weather monitoring device(WMD)**  1. To collect the weather data, these devices are needed.  **B. PC/ Laptop/**  **Other**  **computing**  **device**  1. The data from the devices are stored on storage devices of computers.  2. PCs are used by stakeholders access the system and to input weather data to the system.  **C. Printers**  1. Printers are used  to print the data  sheet by the  data source team. | **A. Microsoft Excel / Google Sheets**  1. All data collected is stored on computers in .CSV files which can be accessed using Excel/Sheets  **B. Operating System**  1. To operate the computer where data is collected and stored, we need an operating system like Windows/ Linux.  **C. Google Forms**  1. Data is collected by system through a provided Google Form.  **D. Printing software**  1. Printing software needed if data is wanted in physical form | **A. Microsoft Excel / Google Sheets**  1. All data collected is stored on computers in .CSV files which can be accessed using Excel/Sheets.  2. System keeps a cumulative data file (data from all sources) as .CSV file.  **B. Data files/ Log files (physical copies)** 1. Paper copies of data is printed and stored in holders and cabinets for backup purposes. | **A. Internet**  1. Internet will be needed for organisations to access the system and form and send the data.  2. The data collecting vehicles will also need internet connection through WIFI or mobile network to send weather and location data to the system.  **B. Telecommunication/phone calls**  1. Stakeholders can communicate with each other using by making phone calls.  2. Organisations can receive feedback on whether their data is consistent through the telephone/mobile phone.  **C. Email**  1. Stakeholders can communicate with each other using email.  2. Organisations can receive feedback on whether their data is consistent through email. |
| **Data Verification** | **A. Forest Ministry**  1. Ministry checks the data from system for anomalies and sends back feedback. | **A. Data Sheet in**  **Printed Version**  1. Physical copies of data sheet is also kept by ministry after verification as backup.  **B. File Holder**  1. Data sheets are kept in organised file holders  **C. Cabinets**  1. The files are kept in the cabinets | **A. PC/ Laptop/**  **Other**  **computing**  **device**  1. PCs are used by ministry access the system.  2. The data verification is done on computers instead of doing it manually like before.  **B. Printers/Copiers**  1. Printers and copiers are used to make copies of the processed and verified data sheets. | **A. Operating System**  1. The data is compared and checked whether they are consistent on the computer, to operate which an operating system like Windows, MacOS is required.  **B. Microsoft Excel / Google Sheets**  1. Data files are accessed and checked for consistency using software like Excel/Sheets  **C. Printing software**  1. Printing software to print or make copies of data sheet. | **A. Microsoft Excel / Google Sheets**  1. The data is stored on computers in .CSV files which can be accessed using Excel/Sheets.  **B. Data files/ Log files (physical copies)** 1. Paper copies of the verified data sheet is printed and stored in holders and cabinets for backup purposes. | **A. Internet**  1. Internet will be needed for ministry to access the system and the data.  **B. Telecommunication/phone calls**  1. Ministry can communicate any problems and any feedback through phone calls.  **C. Email**  1. Ministry can communicate any problems and feedback through email. |
| **Data Processing** | **A. Admin**  1. Admin receives data from system and processes it and sends it back. | **A. Data Sheet in**  **Printed Version**  1. Physical copies of data sheet is also kept by admin after processing as backup.  **B. File Holder**  1. Data sheets are kept in organised file holders  **C. Cabinets**  1. The files are kept in the cabinets | **A. PC/ Laptop/**  **Other**  **computing**  **device**  1. PCs are used by admin to access the system  2. The data processing is done on computers instead of doing it manually like before.  **B. Printers/Copiers**  1. Printers and copiers are used to make copies of the processed and verified data sheets. | **A. Operating System**  1. The processing of the data is done on the computer, to operate which an operating system like Linux, MacOS is required.  **B. Microsoft Excel / Google Sheets**  1. Data files are accessed and checked for consistency using software like Excel/Sheets  **C. Processing software**  1. Automating the processing is our goal so we will be using a software which sorts and combines the data as needed.  **D. Printing software**  1. Printing software to print or make copies of data sheet. | **A. Microsoft Excel / Google Sheets**  1. The data is stored on computers in .CSV files which can be accessed using Excel/Sheets.  **B. Data files/ Log files (physical copies)** 1. Paper copies of the verified data sheet is printed and stored in holders and cabinets for backup purposes. | **A. Internet**  1. Internet will be needed for admin to access the system and the data.  **B. Telecommunication/phone calls**  1. Admin can contact the stakeholders if necessary through phone calls.  **C. Email**  1. Admin can contact the stakeholders if necessary through email. |
| **Entry of processed data** | **A. Admin**  1. Admin entries the processed data back into the system. | **A. Data Sheet in**  **Printed Version**  1. Physical copies of data sheet is also kept by admin after processing as backup.  **B. File Holder**  1. Data sheets are kept in organised file holders  **C. Cabinets**  1. The files are kept in the cabinets | **A. PC/ Laptop/**  **Other**  **computing**  **device**  1. PCs are used by admin to access the system and send processed data back.  **B. Printers/Copiers**  1. Printers and copiers are used to make copies of the processed and verified data sheets. | **A. Operating System**  1. The data entry has to be done on the computer, to operate which an operating system like Linux, MacOS is required.  **B. Microsoft Excel / Google Sheets**  1. Data files are accessed using software like Excel/Sheets  **D. Printing software**  1. Printing software to print or make copies of data sheet. | **A. Microsoft Excel / Google Sheets**  1. The data is stored on computers in .CSV files which can be accessed using Excel/Sheets.  **B. Data files/ Log files (physical copies)** 1. Paper copies of the verified data sheet is printed and stored in holders and cabinets for backup purposes. | **A. Internet**  1. Internet will be needed for admin to access the system and the data.  **B. Telecommunication/phone calls**  1. Admin can contact the stakeholders if necessary through phone calls.  **C. Email**  1. Admin can contact the stakeholders if necessary through email. |
| **Generate reports** | **A. Users**  1. Users are able to generate weather reports and make relevant decisions  **B. Policy Makers**  1. Policy makers are able to generate weather reports and propose changes to the system. | **A. Paper**  1. Users and policy makers have the options to print physical copies of reports. | **A. PC/ Laptop/**  **Other**  **computing**  **device**  1. PC is used to access the system and view and print relevant reports.  2. Policy makers will have an option in the system to recommend changes and make any other comments.  **B. Printers/Copiers**  1. Printers and copiers are used to print and make copies of the reports | **A. Operating System**  1. To operate the computer, we need an operating system like Windows/ Linux.  **B. Printing software**  1. Printing software needed if report is wanted in physical form or copies are to be made | **A. Reports (physical copies)** 1. Paper copies of reports are the only data the users and policy makers have access to. | **A. Internet**  1. Internet will be needed for users and policy makers to access the system and the data.  **B. Telecommunication/phone calls**  1. Policy makers can contact the people maintaining the system if necessary through phone calls.  **C. Email**  1. Policy makers can contact the people maintaining the system if necessary through phone calls email. |