

FES

FOUNDATION FOR ECOLOGICAL SECURITY

# MANUAL FOR CROP WATER BUDGETING



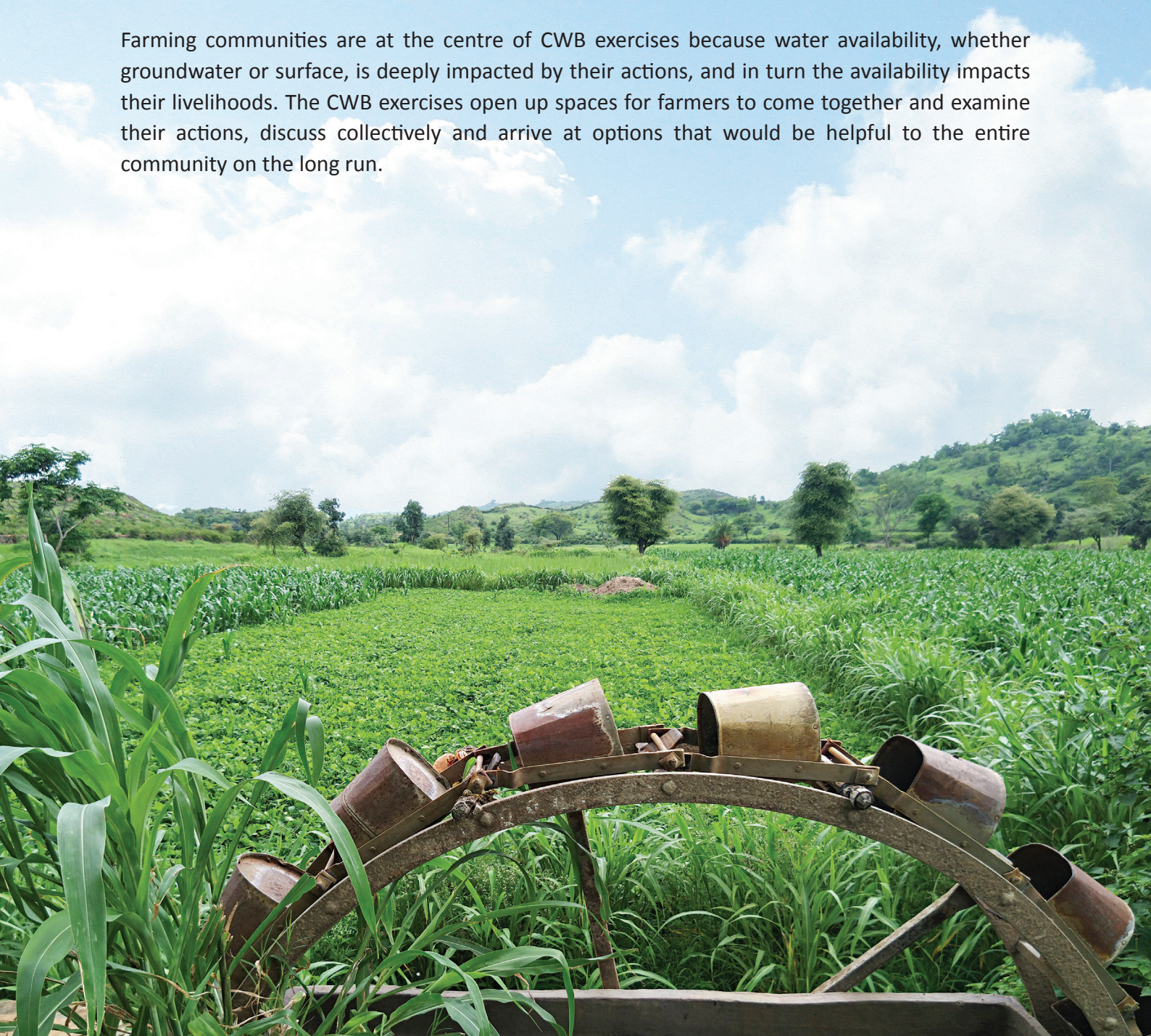


# Crop Water Budgeting

Crop Water Budgeting is a tool developed to assist communities for the proper management of water resources. It is a farmer-centric tool that assists in creating the support system needed for village communities to balance demand with supplies, so that water consumption does not exceed the limits of recharge through rainfall, stream flows and surface water storage.

The Crop Water Budgeting (CWB) tool has been developed to assist communities manage their surface and ground water efficiently without further depleting their resources. While working towards improving the supply of water, the effort is to build awareness about efficient demand side management. This includes assisting village communities to gain an understanding of the current crisis relating to water in farming systems, water as a Commons, techniques and technologies for water saving, policies and programmes related to water, as well as undertaking CWB exercises (including conservation and recharge) with farmers to elicit collective action for judicious use of available water.

Farming communities are at the centre of CWB exercises because water availability, whether groundwater or surface, is deeply impacted by their actions, and in turn the availability impacts their livelihoods. The CWB exercises open up spaces for farmers to come together and examine their actions, discuss collectively and arrive at options that would be helpful to the entire community on the long run.



## Tools and Technologies

With a view to ease the estimation of water availability & requirement for the Rabi season, an android based application i.e. CWB tool has been developed which can be downloaded and installed on any android mobile or tablet for enabling facilitators/ Village Agriculture Workers (VAWs)/ and Community Resource Persons (CRP) to input primary information related to rainfall, number of wells, water harvesting structures, drains, cropping pattern etc. Depending on the input data, the tool calculates the availability of water for the crops after deducting the water requirement for domestic purposes. On the basis of balance situation of water, there is debate & discussions amongst the community and depending upon the water availability for the Rabi season, the community members discuss possible crops/ varieties/ practices etc. to cop- up with the water situation. The exercise generates debate and discussion on water as a collective resource and the need for better governance.

## Key Activities

At its core, CWB is designed as a farmer-friendly and farmer-centric tool for collective decision making. Preparation for CWB involves the VAWs & CRPs along with community members collecting data such as an inventory of existing water bodies and a census of open & bore wells, availability of surface water, documenting groundwater levels and changes across seasons and subsequent years, crops grown during Kharif and Rabi and the area treatment measures undertaken in their village boundary. The data collected are then evaluated against the scientific norms set by various agencies to estimate the water availability and water use.

Once the farmers' plans for the forthcoming Rabi season have been collected, a community level workshop is organised for the CWB exercise. Water availability for the season is evaluated based on the recharge potential of the area by taking into consideration rainfall levels and water storage in the surface structures. This is matched against the water required for cultivation in Rabi season based on the farmers' plans. This is followed by community discussions on balancing the demand and supply side of water, aided by the facilitators providing more information on alternative crops, cropping practices and improved techniques and technology for saving water with higher returns from crop production.

The activities under supply side management include means to increase the availability of water, constructing bunds, farm ponds, percolation tanks, check-dams etc. Demand side management includes regulating the use of water, and requires a great deal of proactive involvement from the farming community as it hinges on their regulation of water used for agricultural purposes. It involves convincing farmers to adopt water saving technologies, change cropping pattern, varietal change, etc.

Based on water availability, farmers are expected to make changes in the crops to be cultivated, practices to be followed and adopt new technologies. The community level deliberations involve developing an understanding of issues related to farming practices, and how one variable impacts the other in a causal loop. A holistic view is developed where a diverse set of parameters, including variables influencing soil productivity (soil fertility, soil erosion, degradation, soil moisture, green manure etc.), factors influencing crop choice (market, domestic need, cropping rotation, yields etc.), irrigation practices (traditional, technology based etc.), water resources (water harvesting structures etc.), pest and diseases, fertilizers, and drought, are considered.



Along with the discussions on demand side management of water, the community members are informed of various programmes, such as watershed development and VB G RAM G- Viksit Bharat – Guarantee for Rozgar and Ajeevika Mission (Gramin), which can be used to augment their water resources. They are also informed about policy provisions related to managing water as common pool resources, provisions supporting and restricting the use of surface and ground water and finally impressing the need for operationalization of the clauses that can determine long term impacts. The commonly agreed decisions are recorded and monitored at community level.

## Impact

The benefits of adopting CWB as a water management tool include an increase in the awareness level among farmers on water resources, use of water saving devices or improved irrigation systems such as drip irrigation, sprinklers etc., sharing of water resources between farmers with lands close by, possible switch from high water intensive crops & varieties to low water intensive crops & varieties, community participation in the promotion of recharge structures and mobilising of financial resources for operation and maintenance of common water resources. And finally, the farming community, being at the centre of the planning and monitoring process, becomes the most effective regulatory body in terms of identifying deviation and taking appropriate action or regulating themselves.

# Steps for undertaking Crop Water Budgeting

There are 12 & 11 sheets in the Crop Water Budgeting Tool for “GROUND WATER BASED CWB” & “SURFACE WATER BASED CWB” respectively. Out of 12 in case of Ground Water Based CWB & 11 in case of Surface Water Based CWB, 9 & 8 sheets are about the estimation of existing water availability & requirement for the Rabi crops as per farmers plan respectively. The other 3 sheets are about the revised plan after the discussion held among the community and the actual crop grown by the farmers and their water demand. To fill those 9 or 8 sheets, there are 4 formats i.e. General, SWB, Drain\_Rabi and Plan for Rabi Crops before CWB.

**Format 1 General** - In this format the general information of village is to be filled up. All the data is collected from the community only except rainfall data. The rainfall in Kharif season is to be collected from any of the secondary sources on actual basis and the rainfall of Rabi season is the average estimation on the basis of last 5 years rainfall for the corresponding period, which is automatically fetched in the application based on the region.

| General Information of village- For Ground Water Based CWB               |  |
|--------------------------------------------------------------------------|--|
| Name of District                                                         |  |
| Name of Block/ Mandal                                                    |  |
| Name of Village                                                          |  |
| Name of the habitation                                                   |  |
| Unit of area (to be decided)- Hectare or Acre                            |  |
| Month of Rabi Season Initiation- Oct/ Nov/ Dec/ Jan                      |  |
| Total Area of Village (ha./ Acre)                                        |  |
| Total cultivated area of village (ha./ Acre)                             |  |
| Total treated area (Ha./Acre)                                            |  |
| Total open wells in Village (No.)                                        |  |
| Total tube/ bore wells in Village (No.)                                  |  |
| Average Rainfall during May to September (MM)                            |  |
| Total open wells used for irrigating Kharif crops in village (No.)       |  |
| Capacity of irrigation pumps used for irrigation (HP) **                 |  |
| Avg. Pumping Hours per Irrigation from open wells (hour)                 |  |
| Avg. No of Irrigations from open wells                                   |  |
| Total tube/ bore wells used for irrigating Kharif crops in village (No.) |  |
| Capacity of irrigation pumps used for irrigation (HP) **                 |  |
| Avg. Pumping Hours per Irrigation from tube/ bore wells (hour)           |  |
| Avg. No of Irrigations from tube/ bore wells                             |  |

**\* Rainfall to be taken from secondary source on actual basis for May to September.**

**\*\* If there are more than one types of irrigation pumps used, please mention the capacity of pumps which are used in most number.**

| General Information of village- For Surface Water Based CWB                                          |  |
|------------------------------------------------------------------------------------------------------|--|
| Name of District                                                                                     |  |
| Name of Block/ Mandal                                                                                |  |
| Name of Village                                                                                      |  |
| Name of the habitation                                                                               |  |
| Unit of area (to be decided)- Hectare or Acre                                                        |  |
| Total Area of Village (ha./ Acre)                                                                    |  |
| Month of Rabi Season Initiation- Oct/ Nov/ Dec/ Jan                                                  |  |
| Total cultivated area of Village (Ha./ Acre)                                                         |  |
| Average Rainfall during May to September (MM)*                                                       |  |
| Open wells to be used for irrigation during Rabi season* * in high slope area (>10%)- No.            |  |
| Open wells to be used for irrigation during Rabi season* * in moderate slope area (5-10%)- No.       |  |
| Open wells to be used for irrigation during Rabi season* * in flat area (<5%)- No.                   |  |
| Tube/ bore wells to be used for irrigation during Rabi season* * in high slope area (>10%)- No.      |  |
| Tube/ bore wells to be used for irrigation during Rabi season* * in moderate slope area (5-10%)- No. |  |
| Tube/ bore wells to be used for irrigation during Rabi season* * in flat area (<5%)- No.             |  |
| Kharif Season * * *                                                                                  |  |
| Total open wells used for irrigating Kharif crops in village - No.                                   |  |
| Capacity of irrigation pumps used for irrigation (HP)                                                |  |
| Avg. Pumping Hours per Irrigation from open wells (hour)                                             |  |
| Avg. No of Irrigations from open wells                                                               |  |
| Total tube/ bore wells used for irrigating Kharif crops in village- No.                              |  |
| Capacity of irrigation pumps used for irrigation (HP)                                                |  |
| Avg. Pumping Hours per Irrigation from tube/ bore wells (hour)                                       |  |
| Avg. No of Irrigations from tube/ bore wells                                                         |  |

**\* Rainfall to be taken from secondary source on actual basis for May to September.**

**\* \* It is to be noted that the data of wells &/ or tube wells to be used for irrigation during Rabi season are to be taken here not for all the wells &/ or tube wells.**

**\* \* \* Data of only wells &/ or tube wells used for irrigation during Kharif season out of the total wells/ tube wells to be used for irrigation during Rabi season are to be taken here.**

**Format 2 SWB** - In this format, the details of various surface water bodies existing in the village are to be filled in for each of the seasons i.e. Kharif & Rabi separately for Ground Water Based CWB and for Rabi season only in case of Surface Water Based CWB. Here the SWB refers to all kinds of surface water storage bodies i.e. pond, check dams, tank etc.

### For Ground Water Based CWB -

The information to be filled in is as mentioned below-

- Name of structure- If there is any local name for the water body, it is to be mentioned.
- Geo-Coordinates- The geo-references of each water body are to be taken.
- Maximum Depth of the Water (met)- It is to be taken for Rabi season only. It is the maximum height of water in any of the structure. In ponds/ tanks, this could be in the centre of the structure and in the case of check dam, it would be adjacent to the dam.
- Water Spread/ Pondage Area (ha./ Acre)- In case of pond/ tank, the area which is filled with water and in case of check dam, the area of back water storage needs to be mentioned.
- No. of fillings- The no. of times the water has overflowed from the structure. If the overflow continues for longer period, it would be counted as one. Once the overflow is stopped and water comes down and again starts to overflow due to rainfall, it would be counted as another filling.
- Status of use of water for irrigation (Utilized/ Un-utilized)- The status of water is taken here for Rabi season only whether the water of this particular structure is being utilized for irrigation or remain unutilized due to certain issues but it can be used if those issues are fixed.
- If Un-Utilized (mention the reason)- If the water of structure is unutilized, the reason is to mention here.

| DISTRICT                                                      |                   | VILLAGE         |                                                      |                                      |
|---------------------------------------------------------------|-------------------|-----------------|------------------------------------------------------|--------------------------------------|
| Details of Surface water bodies (WHS/ Pond/ Tank)- May to Sep |                   |                 |                                                      |                                      |
| S. No.                                                        | Name of Structure | Geo-Coordinates | Water Spread / Pondage / Submergence Area (ha/ Acre) | No. of fillings during Kharif season |
| 1                                                             |                   |                 |                                                      |                                      |
| 2                                                             |                   |                 |                                                      |                                      |
| 3                                                             |                   |                 |                                                      |                                      |
| 4                                                             |                   |                 |                                                      |                                      |
| 5                                                             |                   |                 |                                                      |                                      |

| Details of Surface water bodies (WHS/ Pond/ Tank)- Oct to April |                   |                  |                                |                                                   |                                    |                                          |                                                                                                                                                       |
|-----------------------------------------------------------------|-------------------|------------------|--------------------------------|---------------------------------------------------|------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| S. No.                                                          | Name of Structure | Geo -Coordinates | Maximum Depth of Water (meter) | Pondage/ Water Spread Submergence Area (ha/ Acre) | No. of fillings during Rabi season | Status of water- Utilized/ Un-uti- lized | If Un-utilized - Unavailability of irrigation Pump & pipeline / No electricity / Ban on agriculture use / Very far from the agriculture land / Others |
| 1                                                               |                   |                  |                                |                                                   |                                    |                                          |                                                                                                                                                       |
| 2                                                               |                   |                  |                                |                                                   |                                    |                                          |                                                                                                                                                       |
| 3                                                               |                   |                  |                                |                                                   |                                    |                                          |                                                                                                                                                       |
| 4                                                               |                   |                  |                                |                                                   |                                    |                                          |                                                                                                                                                       |
| 5                                                               |                   |                  |                                |                                                   |                                    |                                          |                                                                                                                                                       |

### For Surface Water Based CWB -

As mentioned above for Surface Water Based CWB, the data of SWBs to be taken for Rabi season only and the information to be filled in is same as filled in the Ground Water Based CWB for Rabi Season.

**Format 3 Drain (Rabi)** - In this format, data is collected for estimation of water available for irrigation during Rabi season from various drains which do not have any kind of water harvesting structure in that particular village.

### For Ground Water & Surface Water Based CWB-

In case of "Ground Water or Surface Water Based CWB" the below mentioned information is to be filled up in this format-

- Name of drain (if any)- If there is any local name of the drain, it is to be mentioned.
- Geo-Coordinates- The geo-references of each drain/ nala are to be taken.
- Distance covered by water in meter (M)- At the start of the village where drain has linear flow, consider the 10 meter length of drain to measure the velocity.
- Time taken to cover the distance in seconds (T)- Any floating material (preferably a piece of plastic material having flat base) to be floated from the starting point of the 10 meter part of the drain and start the stop watch as and when plastic piece is put into water. Now measure the time of reaching this plastic piece to the end point of the 10 meter part of the drain.
- Average width of flowing water in meter (W)- The average width of the flowing water is to be taken from the end point of the 10 meter part. For taking average, take the width of water

from 2-3 levels.

- Average depth of flowing water in meter (D)- The average depth of the water is also to be taken from the end point of the 10 meter part. For taking average, take the depth of water from 2-3 places.
- Period of availability of water in days (P)- The total number of days in which water remains in the particular drain in Rabi season are to be put in this cell.
- Status of use of water for irrigation (Utilized/ Un-utilized)- The status of water is taken here for Rabi season only whether the water of this particular drain is being utilized for irrigation or remain unutilized due to certain issues but it can be used if those issues are fixed.
- If Un-Utilized (mention the reason)- If the water of drain is unutilized, the reason is to mention here.

| Details of Various Drains in the village (Oct- April) |  |         |  |
|-------------------------------------------------------|--|---------|--|
| DISTRICT                                              |  | VILLAGE |  |
| Water Available from Drains (Oct- April)              |  |         |  |
| Name of Drainage Line (Nala)- 1                       |  |         |  |
| Geo-Coordinates                                       |  |         |  |
| Distance covered by Water in Meter -M                 |  | 10      |  |
| Time taken to cover the distance in seconds -T        |  |         |  |
| Average Width of flowing water in meter -W            |  |         |  |
| Average depth of flowing water in meter -D            |  |         |  |
| Period of availability of water in days- P            |  |         |  |
| Name of Drainage Line (Nala)- 2                       |  |         |  |
| Geo-Coordinates                                       |  |         |  |
| Distance covered by Water in Meter -M                 |  | 10      |  |
| Time taken to cover the distance in seconds -T        |  |         |  |
| Average Width of flowing water in meter -W            |  |         |  |
| Average depth of flowing water in meter -D            |  |         |  |
| Period of availability of water in days- P            |  |         |  |
| Name of Drainage Line (Nala)- 3                       |  |         |  |
| Geo-Coordinates                                       |  |         |  |
| Distance covered by Water in Meter -M                 |  | 10      |  |
| Time taken to cover the distance in seconds -T        |  |         |  |
| Average Width of flowing water in meter -W            |  |         |  |
| Average depth of flowing water in meter -D            |  |         |  |
| Period of availability of water in days- P            |  |         |  |

***It is to be noted that data is collected only for those drains whose water is currently being utilized, or has the potential to be utilized for irrigation during the Rabi season after addressing the identified issues. The data does not cover all drains.***

**Format 4 Plan for Crop (Before CWB)** - This is the crop plan for Rabi season evolved by the farmers on their own without any suggestion or any external technical input. In this format farmer wise details is filled up which would further be used to estimate the total requirement of water for the Rabi crops. Various information to be filled in this format, are as under-

- Name of the Rabi crops- Name of various crops to be grown in the Rabi season.
- Method of irrigation- Irrigation method i.e. Flood irrigation, Sprinkler irrigation, Drip irrigation or No Irrigation to be mentioned.
- Number of farmer- Crop wise number of farmers to be mentioned.
- Area under crop (ha./ Acre)- Area to be cultivated under each crop in Rabi season.
- No. of irrigation- Total number of irrigations to be provided to irrigate the specific crop during the Rabi season.
- Pumping hours per irrigation- It is the average of total pumping hours during whole cropping season to irrigate the crops. If there are 5 irrigations and total pumping hours are 20 then the average pumping hours would be 4 hours.
- Avg. capacity of irrigation pump (HP) / No. of sprinkler nozzles used to irrigate once per ha or Acre / No. of drippers used to irrigate once per ha or Acre- In case of flood irrigation, avg. capacity of irrigation pumps (HP), in case of sprinkler irrigation, no. of nozzles used to irrigate one-hectare/ acre land once and in case of drip irrigation, no. of drippers used to irrigate one-hectare/ acre land once is to mention.

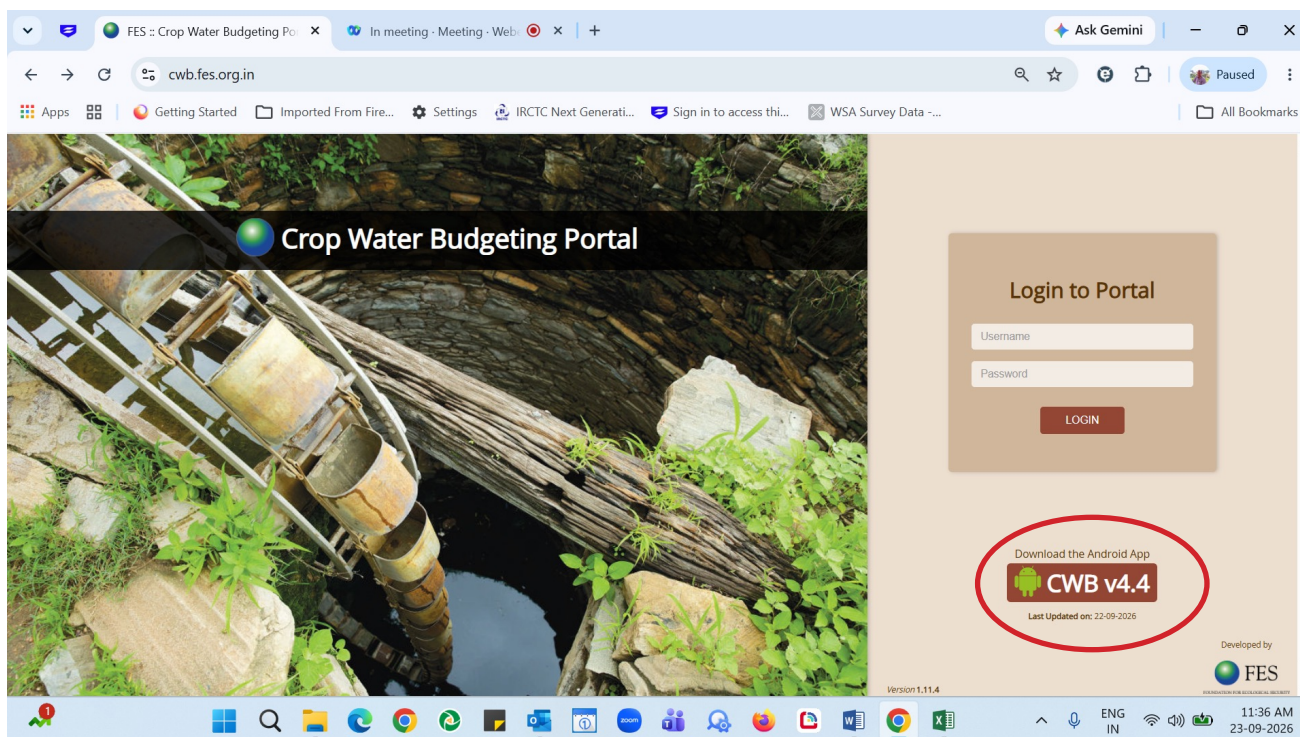
| Crop wise estimation for water usage for Rabi crops – Farmer's Own Plan (Before CWB) |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------|----------------|----------------------------|-------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S. No.                                                                               | Name of the crop | Method of irrigation (Flood/ Sprinkler/ Drip/ No Irrigation) | No. of farmers | Area under Crop (Ha/ Acre) | No. of irrigation | Pump- ing hours/ irriga- tion | Avg. capacity of irrigation pump (HP)- for flood irrigation / No. of sprinkler nozzles used to irrigate once per ha or acre for sprinkler irrigation / No. of drippers used to irrigate once per ha or acre for drip irrigation |
| 1                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 2                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 3                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 4                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 5                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 6                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 7                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 8                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 9                                                                                    |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 10                                                                                   |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 11                                                                                   |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |
| 12                                                                                   |                  |                                                              |                |                            |                   |                               |                                                                                                                                                                                                                                 |

**The information collected in the above formats is now filled up in the Crop Water Budgeting Tool on the android mobile / tablet.**

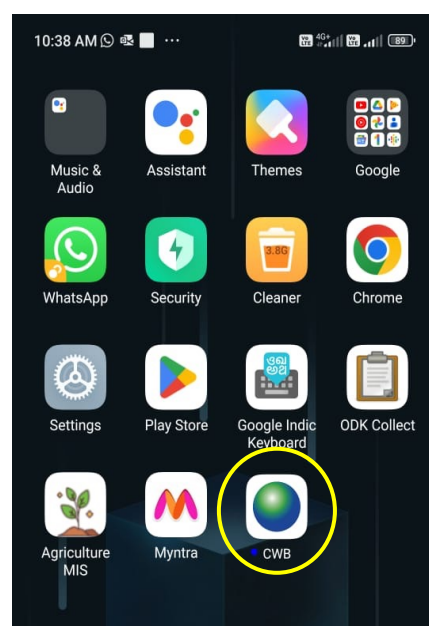
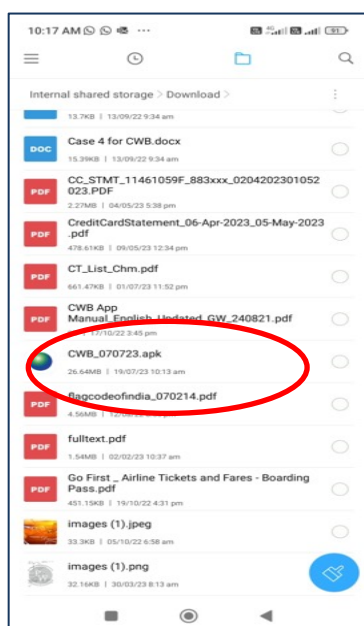
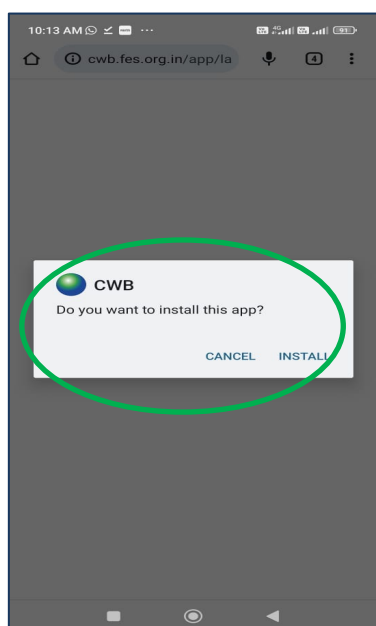
## Downloading and installation of the Crop Water Budgeting Application (CWB App)

It's an open source Android based application and available for downloading on - <https://cwb.fes.org.in/>

First browse the above website on your mobile or tablet which would be seen like below picture. Click on the 'CWB v4.4' icon as shown in the above picture in red circle.



The app would be downloaded on your mobile/ tablet and immediately after downloading, it would ask for installing as shown in the picture below in green circle which is to be installed or can be installed later on from the internal storage in download folder or stored in another folder on the mobile/ tablet depending upon the mobile version by clicking on the APK as shown in picture below in red circle. The CWB app would be now installed and an icon would appear on the mobile / tablet as shown in yellow circle in the picture.



## Registration and downloading the CWB form

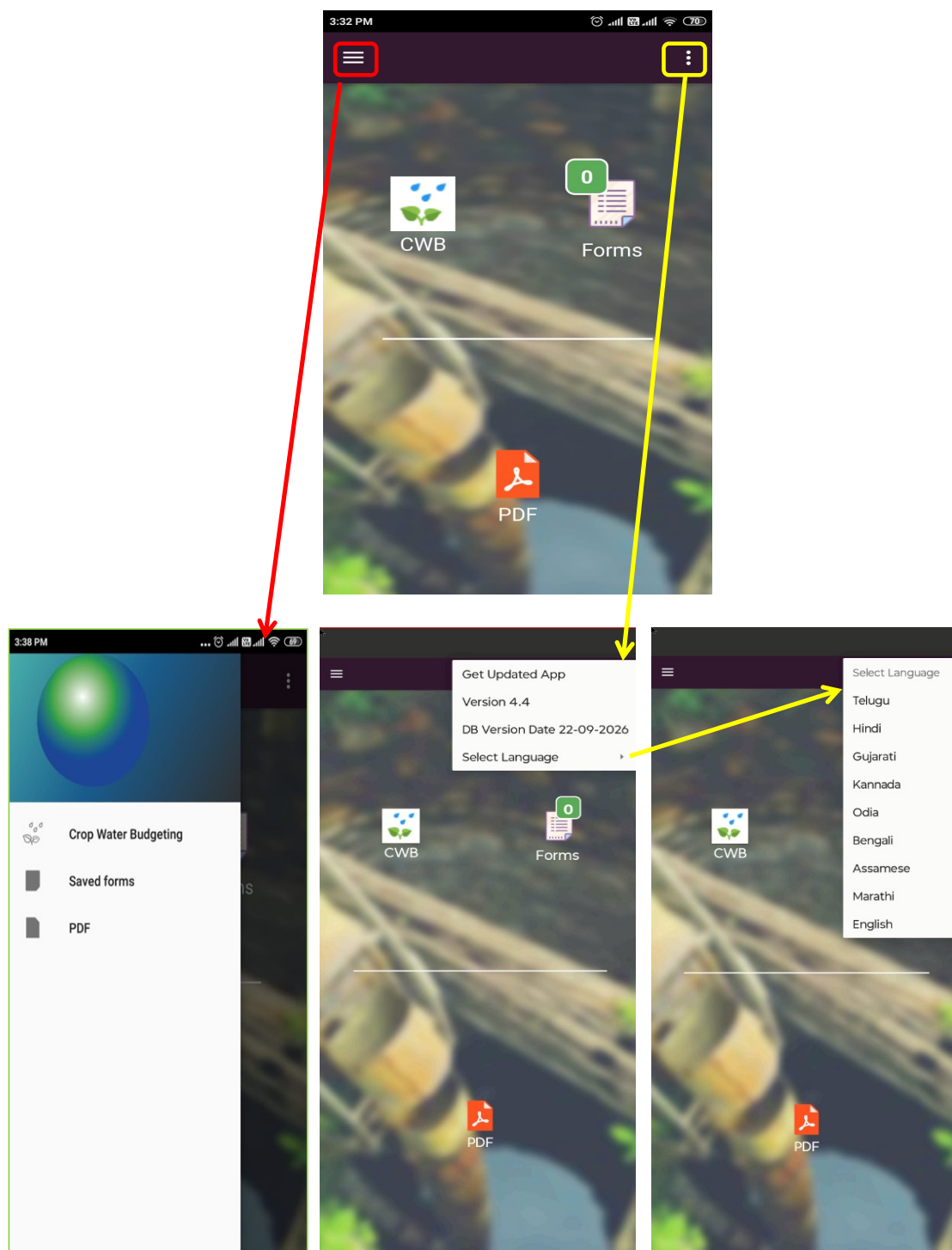
Once you click on the CWB icon, it would ask for some permissions like to access photos, videos etc., which are to be allowed. After allowing the registration page would open where user needs to register him/herself only once. Before registration some DB files would be downloaded automatically which may take a few minutes. If there is no downloading, please click on the back button of your mobile or minimize the CWB & open/ maximize after few seconds, the files would get downloaded now. After completion of downloading one can register her/himself.

The image displays three sequential screenshots of a mobile application's 'User Registration' screen. The first screenshot (11:04 AM) shows the form with fields for First name, Last Name, Mobile, District, and Organization Name, and a 'REGISTER' button. A 'Downloading' dialog box is overlaid, showing a progress bar at 3% of 3/100. The second screenshot (11:11 AM) shows the same form with a 'DB file downloaded successfully' message and an 'OK' button. The third screenshot (11:16 AM) shows the completed form with the following details: First name: Rajesh, Last Name: Mittal, Mobile: 8160201827, State: Gujarat, District: Anand, and Organization Name: Foundation for Ecological Security (FES). The 'REGISTER' button is still visible at the bottom.

After clicking on REGISTER, the below mentioned sheet would appear. There are 3 lines on the left side and 3 dots on the right side as outlined in red and yellow colour respectively. Also, it may ask for allowing to access the location of the device which is to be allowed.

On clicking on the lines, page will open showing the Crop Water Budgeting, Saved Forms and PDF which are otherwise are shown on earlier page also.

On clicking on the 3 dots, a window will open showing Get updated app, present app information and select language option. If there is any updated version of the app, by clicking on the Get Updated App, it would be updated. By clicking on the **Select Language**, one can chose the language among 9 languages in which the data is to be fed in the application as shown in the picture below.



***It is to be noted that it is required to be in internet zone till registration & download. After that it would work in offline mode (without internet). If you want to Get Updated App, the device should have internet connectivity.***

## Filling up the CWB forms

To start the Crop Water Budgeting for a particular village, click on the CWB button and one window would appear, in which 4 options are there; 1. GROUND WATER, 2. SURFACE WATER, 3. GROUND WATER ACTUAL CROP & 4. SURFACE WATER ACTUAL CROP.

In a location, where Rabi crops are grown mainly with ground water (Wells & tube wells), “GROUND WATER” is to be selected and if Rabi crops are grown mainly with surface water (WHS, streams/ drains etc.) & to some extent with sub surface/ ground water, “SURFACE WATER” is selected.

Other two options i.e. “GROUND WATER ACTUAL CROP” & “SURFACE WATER ACTUAL CROP” are to be used in the later stage of Rabi crops i.e. in Feb-April for estimation of actual water applied in the crops.

If you click on GROUND WATER or SURFACE WATER, a sheet would appear, in which Data Collection Type, State, District, Block, Village & Financial Year details are to be selected from the dropdown as shown in the picture below. Please note if the application is being used for the testing or training purpose, the “Testing” or “Training” is to be selected only. When the data collection in any of the villages is done on actual basis, only in that case “Actual” would be selected. There are dropdowns for all the information like State, District, Block & Village and one has to just select from the dropdown.

After filling the required information, click on the SUBMIT button and CWB Configuration sheet will open in which one has to select the ‘Unit of Area’ and ‘Rabi Season Start Month’ as shown in the picture below.

The image displays two sequential screenshots of a mobile application interface for Crop Water Budgeting (CWB).

**Left Screenshot:** Shows a menu with four options: "GROUND WATER", "SURFACE WATER", "GROUND WATER ACTUAL CROP", and "SURFACE WATER ACTUAL CROP". A dialog box asks "For which type you want to proceed?".

**Right Screenshot:** Shows the "CWB Configuration" screen. It includes dropdown menus for "Data Collection Type" (Testing), "State" (Gujarat), "District" (Anand), "Block" (Borsad), and "Village" (Dabhasi). Below these are sections for "Area Unit" (Which area unit do you want to use across the CWB process? with radio buttons for Hectare and Acre) and "Village Planning" (Select Rabi Start Month with a dropdown menu showing November). A "Save Configuration" button is at the bottom.

Once the configuration is saved, different sheets would appear on the screen one by one for filling the data collected earlier in the 4 formats in participation with community to estimate the availability & demand of water through this application.

## Sheet No. 1- Recharge from Direct Rainfall (May- September)

### A. In case of “GROUND WATER” selected

In this sheet, the Rainfall, Village Area and Recharge Potential data will be automatically fetched from the backend. However, the rainfall data should be replaced with data obtained from a reliable secondary source. Similarly, the Village Area should be verified with the community. If the community reports any variation in the village area, the area confirmed by the community should be entered in this sheet.

Other data like Total Cultivated Area of the village, Area without treatment/Treated Area of the village etc. are to be asked with the community & entered into the sheet.

Total cultivated area cannot be more than the Total Village Area and the application won't allow it to enter. Also, the sum of the Area Without Treatment & Treated Area will always be the exactly same as the Total Village Area.

The screenshots show the following data entry process:

- Sheet Title:** Crop Water Budgeting (May-Sep) Recharge from direct rainfall
- District:** Anand
- Village:** DABHASI
- Habitation Name:** abd
- Rainfall (MM):** 822
- Village Area (Ha):** 499
- Total cultivated area (Ha):** 500 (Error: Total cultivated area cannot exceed village area.)
- Village area without treatment Area (Ha):** 150
- Recharge Rate (%):** 18
- Treated area of village Area (Ha):** 349
- Recharge Rate (%):** 20
- Geopoint:** Longitude: 72.9868624, Latitude: 22.5340434, Altitude: 7.699999809265137, Accuracy: 18.249
- Calculate** button

Additional calculated values shown in the final screenshot:

- Recharge to ground water without treatment:** 221940
- Recharge to ground water from treated area:** 573756
- Total recharge to ground water (cum):** 795696

## B. In case of “SURFACE WATER” selected

Like the Ground Water Based CWB, in this sheet also, the Rainfall, Village Area and Recharge Potential data will be automatically fetched from the backend and the rainfall data should be replaced with data obtained from a reliable secondary source. Similarly, the Village Area should be verified with the community and the area confirmed by the community to be considered as final one.

To take the geo coordinates, click on the “Geopoint” button. If geo coordinates do not appear within a minute or two, one can proceed by clicking the button “Calculate”. After clicking the “Calculate” button the “Total Recharge to Ground Water (CUM)” would be calculated automatically and appear on the sheet.

After filling the form, 3 buttons i.e. “Clear”, “Next” & “Save and exit” would appear at the bottom. If any of the data is wrongly filled, click on the “Clear” button and all the data would be deleted & one can fill the data again. If the data filled is correct, can be continued for the next form or can be saved the filled form and exit from the app. The form would be saved and whenever you like, can continue to fill it from the subsequent form.

It is to be noted, once the “Next” or “Save & Exit” button is clicked, the filled data cannot be edited or deleted by the users here itself. If it is observed later on that the data filled is wrong, one has to complete the form till 9th or 8th sheet in case of Ground Water Based CWB & Surface Water Based CWB respectively and the form can be deleted here and the new form can be filled for the same village.

**Crop Water Budgeting (May-Sep)**  
**Recharge from direct rainfall**

District: Dohad  
Village: BHICHOR  
Habitation Name: abc  
Area of village (Ha): 423.62  
Total cultivated area (Ha): 200  
Rainfall (MM): 842.78

**For Open Wells**  
High slope area  
No. of irrigation wells: 4  
Moderate slope area  
No. of irrigation wells: 5  
Flat land  
No. of irrigation wells: 8

**Recharge Rate (%)**  
12

**For Tube Wells**  
High slope area  
No. of irrigation tube wells: 0  
Moderate slope area  
No. of irrigation tube wells: 0  
Flat land  
No. of irrigation tube wells: 0  
Catchment area of tube wells (Ha): 0

**Recharge Rate (%)**  
14

Water recharge in open wells: 114281  
Water recharge in tube wells: 0  
Total recharge (cum): 114281

Geopoint

Calculate

Clear Next Save & Exit

## Sheet No. 2- Recharge from Surface Water Bodies (May-Sep) - For “GROUND WATER” only

This sheet would appear only in case the CWB is selected for “Ground Water”. Data for multiple structures can also be filled in this sheet. Once the data for one structure is filled and click the next button, it would ask for another SWB data as shown under. Click ‘Yes’ for adding data or ‘No’ for moving to next form.

5:39 29°

←

**Crop Water Budgeting (May-Sep)**

**Recharge from Surface Water Bodies (SWB)**

Rainfall (MM) 822.0

Recharge Rate (%) 20

S. No.1

Name of Structure

Enter Value

Water Spread Area/ Pondage Area (Ha)

Enter Value

No. of fillings during Monsoon

Enter Value

Geopoint

Calculate



5:40

←

**Crop Water Budgeting (May-Sep)**

**Recharge from Surface Water Bodies (SWB)**

Rainfall (MM) 822.0

Recharge Rate (%) 20

S. No.1

Name of Structure

asr

Water Spread Area/ Pondage Area (Ha)

2

No. of fillings during Monsoon

3

Ground water recharge from SWB (CUM)

9864

Total water recharge from SWB (CUM)

9864

Geopoint

Longitude: 72.9868596  
Latitude: 22.5340454  
Altitude: 7.699999809265137  
Accuracy: 18.058

Clear Next Save & Exit

1:08 PM

←

Rainfall(mm) 849.3

Recharge Rate(%) 20

S. No. 1

Name of Structure

Mandir wala Talab

Water Spread Area/ Pondage Area (Ha)

1

No. of fillings during Monsoon

2

Ground water recharge from SWB (CUM)

3397

Total Water Recharge from SWB (CUM)

3397

Clear Next Save and exit

Do you want to add another SWB data?

YES NO

**Sheet No. 3 in case of “GROUND WATER” & Sheet No. 2 in case of “SURFACE WATER”- Discharge during Kharif Season (May-Sep)**

In this sheet, data regarding the open wells & tube wells/ bore wells used for irrigation during Kharif season, to be filled. Here the ground water discharged during the Kharif season for protective irrigation would be calculated & would get discounted from the total recharge which would be available for Rabi season.

**Crop Water Budgeting(May-Sept)**

**Discharge during Kharif Season**

**Open Well**

Number of well  
5

Capacity of irrigation pump (in HP)  
5

Discharge Rate (lit/min)  
667

Hours per irrigation (hour)  
4

No of Irrigation  
2

**Bore Well**

Number of bore well  
3

Capacity of irrigation pump (in HP)  
5

Discharge Rate (lit/min)  
667

Hours per irrigation (hour)  
4

No of Irrigation  
2

**Discharge Result**

Total Ground Water Discharge From Open Well(Lit)  
**1600800**

Total Ground Water Discharge From Bore Well(Lit)  
**960480**

Total Ground Water Discharge (cum)  
**2561**

Ground Water Recharge through irrigation return flow  
**512**

Sheet No. 4 in case of “GROUND WATER” & Sheet No. 3 in case of “SURFACE WATER”- Balance making (May-Sep)

1:22 PM

4G

80

←

Balance making (May-Sept)

Total Recharge (cum)

2050722

Total Discharge (cum)

2561

Surplus (cum)

2048161.0

Deficit (cum)

0

Discharge

Recharge

Next

Above sheet depicts the total ground water recharged during the Kharif season & how much out of that discharged for irrigating the Kharif crops and balance ground water available for the next season i.e. Rabi Season.

Up to the above sheet, information of Kharif season has been filled up and above balance will appear showing the surplus water available for subsequent Rabi season. Information of Rabi season would now be filled up in Sheet no. 5 (in case of “GROUND WATER”) or Sheet No. 4 (in case of “SURFACE WATER”) & onwards.

Sheet no. 5 (in case of “GROUND WATER”) or Sheet No. 4 (in case of “SURFACE WATER”)- Recharge from Direct Rainfall (Oct- April)

1:25 PM

←

**Crop Water Budgeting(Oct-April)**

**Recharge from Direct Rainfall**

Estimated Rainfall

40

Village area without treatment

Area (ha)

450.0



Recharge rate %

18

Treated Area of village

Area (ha)

800.0



Recharge rate %

20

Recharge to ground water without treatment

32400

Recharge to ground water from treated area

64000

**Total recharge to Ground Water(cum)**

96400

Clear Next Save and exit

3:34 PM

←

**Crop Water Budgeting(Oct-April)**

**Recharge from Direct Rainfall**

District Anand

Village GOPALPUR

Rainfall(mm)

32.43

For Open wells

High Slope area

No. of irrigation wells

2.0

Moderate Slope area

No. of irrigation wells

5.0

Flat Land

No. of irrigation wells

5.0

Catchment area of open wells (ha)

79



Recharge rate %

18

For Tube wells

High Slope area

No. of irrigation tube wells

1.0

Moderate Slope area

No. of irrigation tube wells

2.0

Flat Land

No. of irrigation tube wells

4.0

Catchment area of tube wells (ha)

52



Recharge rate %

20

Water recharge in open wells

4612

Water recharge in tube wells

3373

**Total recharge(cum)**

7984

Clear Next Save and exit

In the above sheet, there is no need to fill any data as all the data would appear here from the earlier sheets filled. One has to just click on the “Calculate” button and the Total Recharge would be calculated here.

**Sheet No. 6 (in case of “GROUND WATER”) or Sheet No. 5 (in case of “SURFACE WATER”) - Water Available from Surface water bodies (WHS/ Pond/ Tank) (Oct to April)**

Data for multiple structures can also be filled in this sheet. Once the data for one structure is filled and click the next button, it would ask for another SWB data as shown in the picture. Click ‘Yes’ for adding data or ‘No’ for moving to next form.

Once the “No” button is clicked, another window would open which would ask about to “Add data for DRAINS” as shown in the picture. If there are any drains in the village which are used for irrigation or can be used for irrigation during Rabi season, ‘YES’ button is clicked and subsequent sheet for entering the data of drains would open.

**Crop Water Budgeting (Oct- April)**

**Water Available in Surface Water Bodies (WHS/ Pond/ Tank/ Reservoirs etc.)- Oct- April**

|                                                               |                |
|---------------------------------------------------------------|----------------|
| Estimated Rainfall (MM)                                       | 34.0           |
| S. No.1                                                       |                |
| Name of Structure                                             | asr            |
| Maximum depth of water (Meter)                                | 2              |
| Water Spread Area/ Pondage Area (Ha)                          | 2              |
| No. of fillings during Rabi season (to be asked by community) | 1              |
| Status                                                        | Utilized Water |
| Available surface water (CUM)                                 | 20000          |
| Ground water recharge from SWB (CUM)                          | 136            |
| Total water available from SWB (CUM)                          | 20136          |
| Total water available from all SWB (CUM)                      | 20136          |
| Geopoint                                                      |                |
| Clear                                                         | Next           |
| Save & Exit                                                   |                |

**Do you want to add another SWB data?**

YES NO

**Do you want to add data for DRAINS?**

YES NO

**Sheet No. 7 (in case of “GROUND WATER”) or Sheet No. 6 (in case of “SURFACE WATER”) - Water Available from Drains/ Streams (Oct to April)**

Data for multiple drains can be filled in this sheet. Once the data for one drain is filled and click the next button, it would ask for another Drain data as shown under. Click ‘Yes’ for adding data or ‘No’ for moving to next form.

5:48

←

**Crop Water Budgeting (Oct- Apr)**

**Water available from Drains/ Streams (Oct- April)**

Name of Drainage Line (Nala)1

edf

Distance covered by Water in Meter- M

10

Time taken to cover the distance in seconds- T

25

Average width of flowing water in meter- W

2

Average depth of flowing water in meter- D

1

Period of availability of water in days- P

50

Status

Utilized Water

Velocity of water (M/T)- V

0.4

Cross section area of running water (W\*D)- A

2.0

Discharge (cum/sec)- QSEC

0.8

Water available for a particular period in CUM- Q1

864000

Total water available in Drains/ Streams

864000

Geopoint

Clear Next Save & Exit

4:36 PM

View Files & Extras

←

50

Velocity of water (M/T)- V

0.4

Cross Section Area of Running

0.4

Do you want to add Water drain data?

YES NO

Water Available for a particular period in CUM- Q1

216000

Total water available in Drains/ Streams

216000

Clear Next Save and exit

**Sheet No. 8 (in case of “GROUND WATER”) or Sheet No. 7 (in case of “SURFACE WATER”) - Estimation of water usage for Rabi crops**

5:49

←

**October to April**

S. No.1

Name of the Rabi Crop

Carnation

No. of Farmers

50

Area under Crops (Ha)

25

Method of irrigation

Select Value

No. of irrigation

Enter Value

Pumping hours/ irrigation

Enter Value

Discharge Rate of irrigation pump (Lit/ hour)

Enter Value

Calculate

Total area should be less than or equal to 250.0(Hectare)

5:51

←

**Estimation of water usage for Rabi crops**

**October to April**

S. No.1

Name of the Rabi Crop

Carnation

No. of Farmers

50

Area under Crops (Ha)

100

Method of irrigation

Drip

No. of irrigation

15

Pumping hours/ irrigation

8

No. of drippers used to irrigate once/ per hectare

25000

Discharge Rate of single nozzle (Lit/ hour)

4

**Total water requirement (cum)**

1200000

Clear Next Save & Exit

Data for multiple crops (to be selected from the drop down in “Name of the Rabi Crop” section) with different irrigation methods i.e. Flood, Sprinkler, Drip methods or crops with “No Irrigation” can be filled in this sheet. Once the data for one crop is filled and click the next button, it would ask for another crop data as shown under. Click ‘Yes’ for adding data or ‘No’ for moving to next form.

If we click on the No button, we would get the estimation of total water available & requirement for Rabi season in the next sheet, which would be depicted in pictorial form also.

12:58 PM

←

Area under Crop (Ha)

50

No. of irrigation

5

Pumping hours/ irrigation

15

Do you want to add crop data to estimate water expenditure?

YES NO

Discharge rate of irrigation pump (litres/ hour)

40000

**Total water Requirement (cum)**

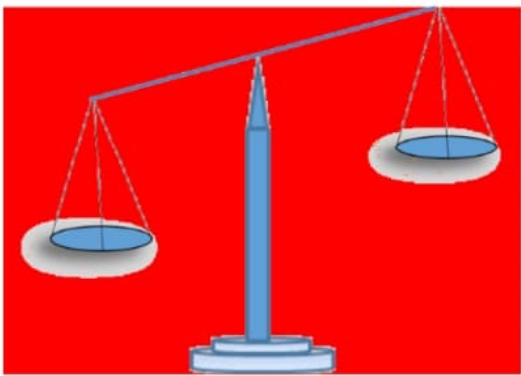
150000

Clear Next Save and exit

Sheet No. 9 (in case of “GROUND WATER”) or Sheet No. 8 (in case of “SURFACE WATER”) – Budget for October to April

In case of “GROUND WATER”

| Budget for October to April                  |         |
|----------------------------------------------|---------|
| Available for Agriculture from Ground Water  | 440848  |
| Surface water available from SWB             | 20000   |
| Utilized surface water available from drains | 864000  |
| Total water available (Surface+Ground Water) | 1324848 |
| Water Demand                                 | 1563000 |
| Surplus                                      | 0       |
| Deficit                                      | 238152  |



Deficit
Surplus

Next
Save & Exit

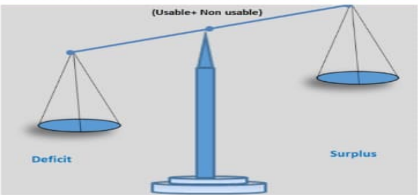
In case of “SURFACE WATER”

| Budget for October to April                          |        |
|------------------------------------------------------|--------|
| Available for Agriculture from Ground Water          | 52940  |
| Utilized surface water available from SWB            | 0      |
| Un-Utilized surface water available from SWB         | 0      |
| Utilized surface water available from drains         | 0      |
| Un-Utilized surface water available from drains      | 0      |
| Total utilized water available (Surface + Ground)    | 52940  |
| Total un-utilized water available (Surface + Ground) | 0      |
| Total water available (Utilized + Un-Utilized)       | 52940  |
| Water Demand                                         | 900000 |
| Surplus- with total utilized water available         | 0      |
| Deficit- with total utilized water available         | 847060 |



Deficit
Surplus

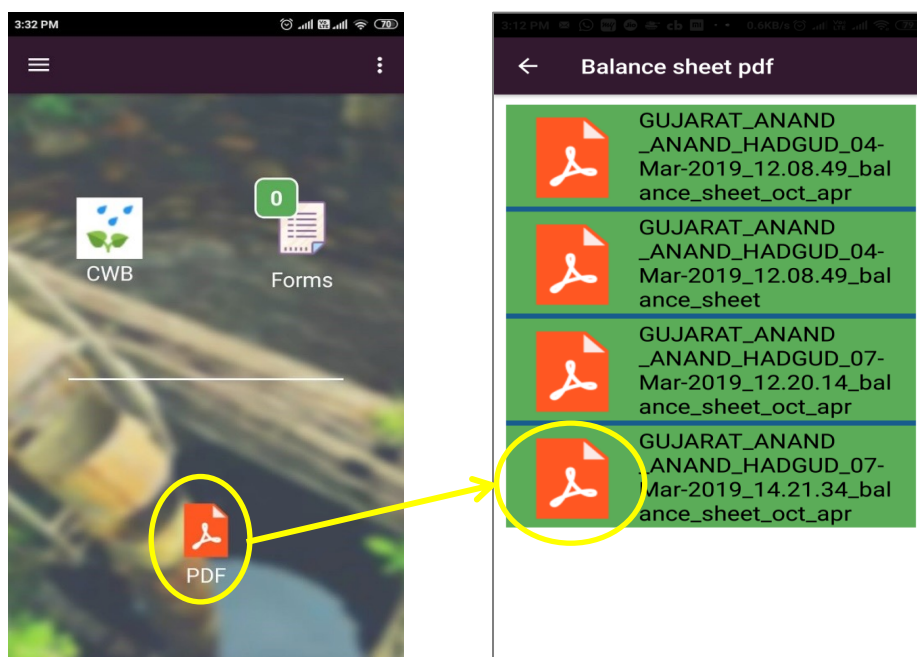
|                                                               |        |
|---------------------------------------------------------------|--------|
| Surplus- with total water (Utilized + Un-Utilized ) available | 0      |
| Deficit- with total water (Utilized + Un-Utilized ) available | 847060 |



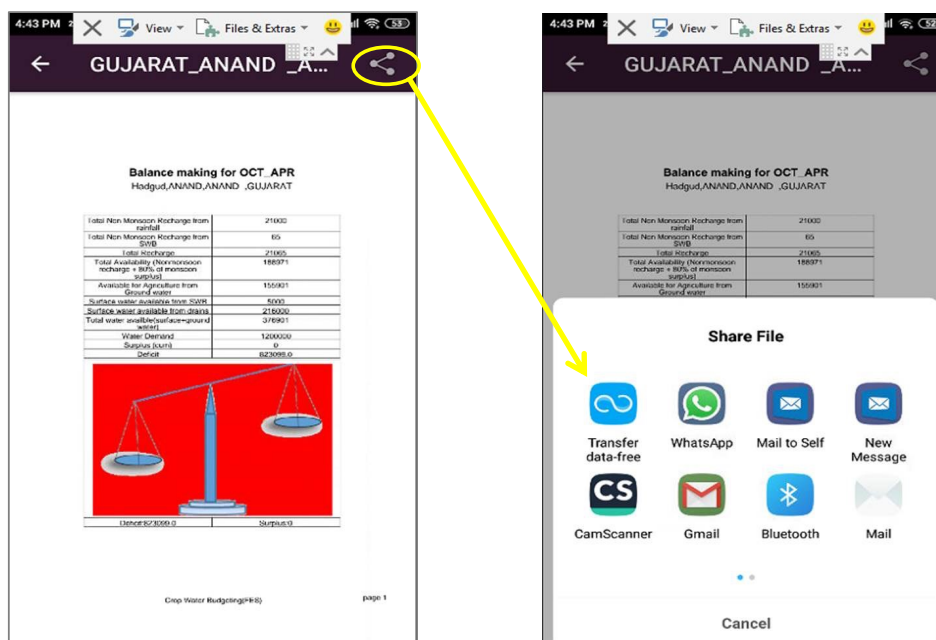
Deficit
Surplus

Next
Save & Exit

We can save & exit here and in the main page, PDF would be available of the above sheet i.e. Sheet no. 9 or Sheet no. 8, which can further be used for developing poster/ flax for using it in the community discussions. By clicking on the PDF logo, list of all the PDF files will appear on the screen as shown under.



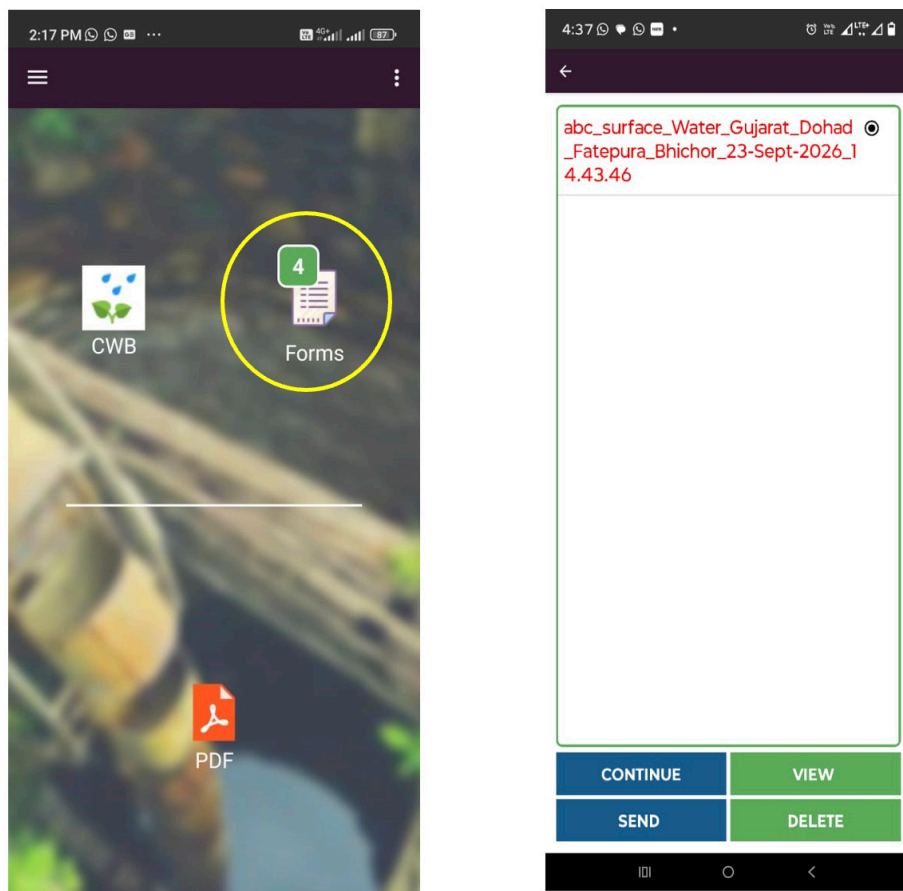
As we click on any of the PDF in the list, the selected PDF file would appear on the screen, which can be shared via email, whatsApp, Bluetooth etc.



**NOTE-** It is to be noted that after getting the water estimation in sheet no. 9 or 8, the dash board is prepared and presented before the community for triggering the discussion amongst them about crop water management. The detail of dashboard preparation & presentation is presented at the last. This is preliminary presentation to discuss possible changes in the cropping or/ and practices to encourage water savings.

The saved form will be available and can be continued whenever you want.

When you click on the forms button as shown in the above picture in yellow circle, the list of saved forms will appear on the screen. The incomplete forms would be in red colour and completed ones would be in black colour.



There are 4 buttons below the list of forms i.e. **CONTINUE**, **SEND**, **VIEW** & **DELETE**. The incomplete form (in red colour) to be sent to server by selecting the particular form & clicking on **SEND** button here but it would remain in the mobile or tablet till it is not completed and whenever you want to complete, select the incomplete form from the list and click on the **CONTINUE** button, the form would open and subsequent sheet will be available for filling the data.

If incorrect data is entered at any stage of the CWB process and the exercise needs to be repeated, the form can be deleted from here. Select the relevant form and click on the **DELETE** button.

**Sheet No. 10 (in case of “GROUND WATER”) or Sheet No. 9 (in case of “SURFACE WATER”) – Estimation for water usage for Rabi crops- Revised**

After discussion amongst community, there may be chance of changing their Rabi crop plan & if it is so, the data of revised plan is filled in the Sheet no. 10 or 9.

5:54

←

**Estimation of water usage for Rabi crops Revised**

**October to April**

S. No1

Name of the Rabi Crop

Select Value

No. of Farmers

Enter Value

Area under Crops (Ha)

Enter Value

Method of irrigation

Select Value

No. of irrigation

Enter Value

Pumping hours/ irrigation

Enter Value

Discharge Rate of irrigation pump (Lit/ hour)

Enter Value

Calculate



5:56

←

**Estimation of water usage for Rabi crops Revised**

**October to April**

S. No1

Name of the Rabi Crop

Cauliflower

No. of Farmers

50

Area under Crops (Ha)

150

Method of irrigation

Flood

No. of irrigation

4

Pumping hours/ irrigation

10

Avg. Capacity of irrigation pump (in HP)

5 HP

Discharge Rate of irrigation pump (Lit/ hour)

40000

**Total water requirement (cum)**

240000

Clear

Next

Save & Exit

The above sheet is the same as the sheet no. 8 (in case of Ground Water) & sheet no. 7 (in case of Surface Water) and data for multiple crops can be filled in this sheet also. Once the data for one crop is filled and click the next button, it would ask for another crop data. Click ‘Yes’ for adding data or ‘No’ for moving to next form. In the next sheet, we would get the estimation of total water available & revised requirement for Rabi season, which would be depicted in pictorial form also as shown in the next sheet.

Sheet No. 11 (in case of “GROUND WATER”) or Sheet No. 10 (in case of “SURFACE WATER”) - Budget for October to April

In case of “GROUND WATER”

5:57

VB3 LTE

Budget for October to April

Available for Agriculture from Ground Water

345808

Surface water available from SWB

20000

Utilized surface water available from drains

864000

Total water available (Surface+Ground Water)

1229808

Water Demand

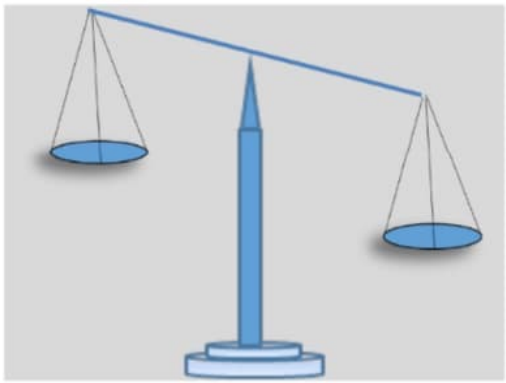
240000

Surplus

989808

Deficit

0



Deficit

Surplus

Next

Save & Exit

In case of “SURFACE WATER”

4:39

VB3 LTE

Budget for October to April

Available for Agriculture from Ground Water

52940

Utilized surface water available from SWB

0

Un-Utilized surface water available from SWB

0

Utilized surface water available from drains

0

Un-Utilized surface water available from drains

0

Total utilized water available (Surface + Ground)

52940

Total un-utilized water available (Surface + Ground)

52940

Water Demand

432000

Surplus- with total utilized water available

0

Deficit- with total utilized water available

379060



Deficit

Surplus

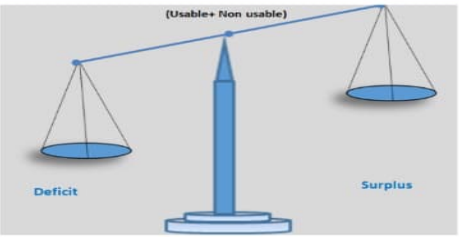
Surplus- with total water (Utilized + Un-Utilized ) available

0

Deficit- with total water (Utilized + Un-Utilized ) available

379060

(Usable+ Non usable)



Deficit

Surplus

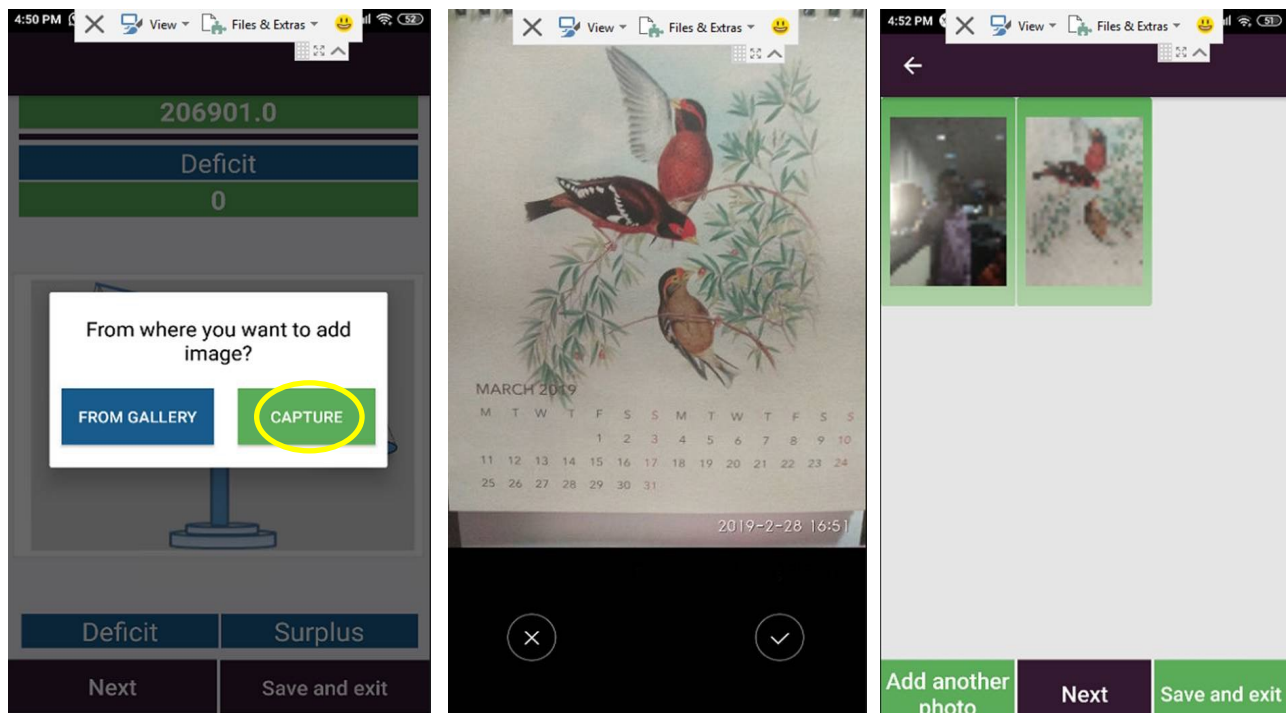
Deficit

Surplus

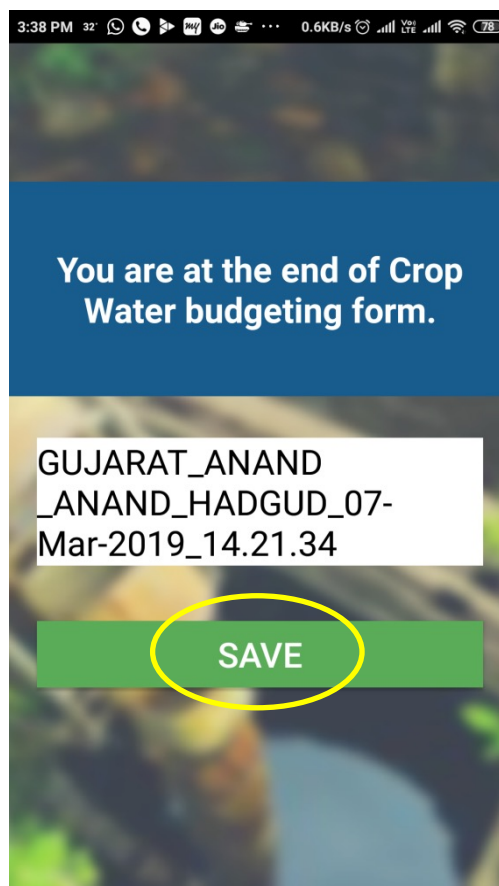
Next

Save & Exit

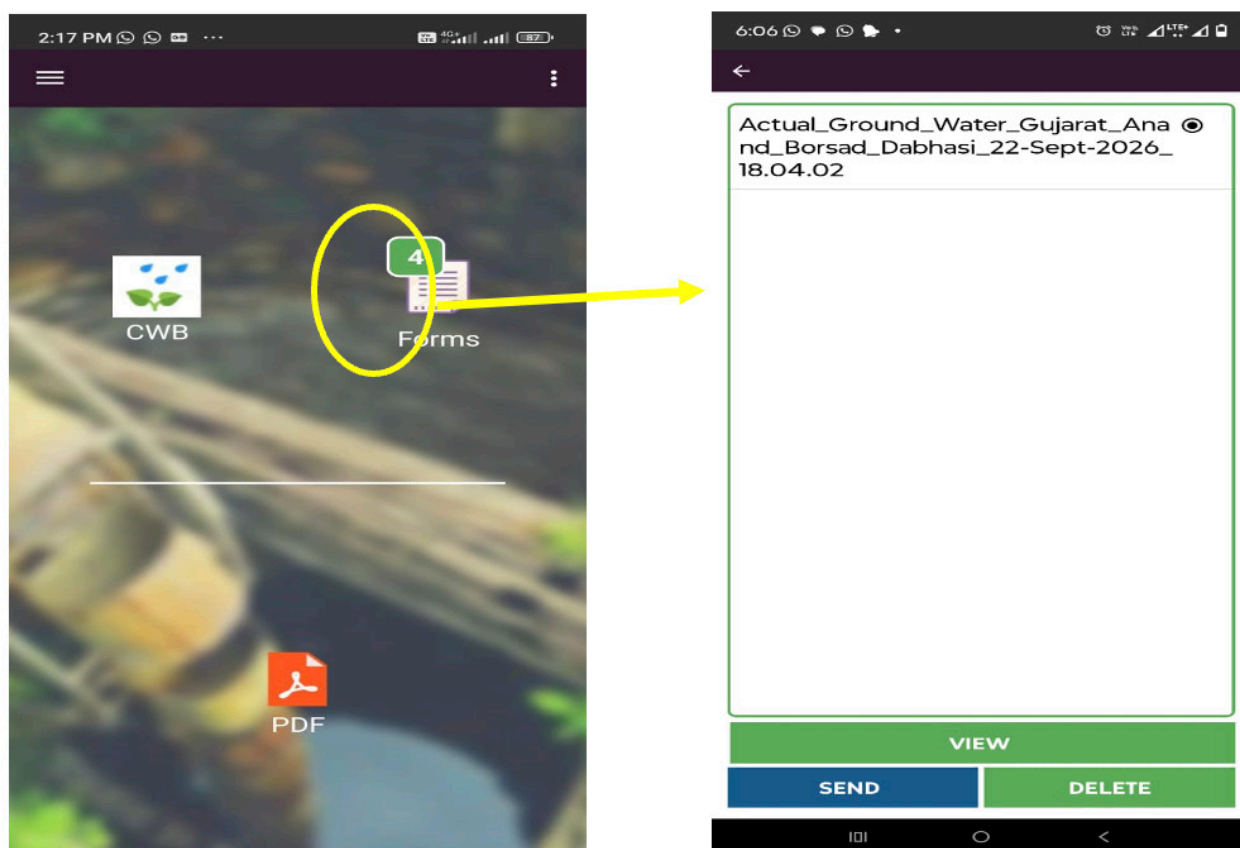
On clicking the Next button, a window would open asking for adding the image. One can add image from gallery or capture. If we click capture, the camera would open and multiple photos can be captured one by one as shown below-



Clicking on Next button, the below mentioned screen would open and you can save your completed form here by pressing SAVE button.



The saved form would appear on the main page along with PDFs as shown under-



After clicking on the Forms button, all the forms saved would appear on the screen with CONTINUE, SEND, VIEW & DELETE buttons. It is to be noted that incomplete forms would be in RED colour & completed forms would appear in BLACK colour.

When we select a completed form from the list, the CONTINUE button would disappear and only SEND, VIEW & DELETE buttons would be there and when SEND button is clicked, the form would be saved on the server and now this form is not available in the mobile/ tablet.

If there is any error in the filled form, the form can be deleted here by clicking on DELETE button and the new form can be filled for the same village.

***It is to be noted that for sending the form to the server the internet connectivity is needed.***

The PDFs generated after sheet no. 9 or 8 and sheet no. 11 or 10, would be saved in the mobile/ tablet despite sending the form to the server and would be available until those are not removed/ deleted from the device.

These PDFs can be shared via different ways and used to develop posters/ flax charts etc. for using in the community/ farmers meeting.



← GUJARAT\_ANAND \_A...

Balance making for OCT\_APR  
Hadgud,ANAND,ANAND ,GUJARAT

|                                                                   |              |
|-------------------------------------------------------------------|--------------|
| Total Non Monsoon Recharge from rainfall                          | 21000        |
| Total Non Monsoon Recharge from SWB                               | 65           |
| <b>Total Recharge</b>                                             | <b>21065</b> |
| Total Availability (Nonmonsoon recharge + 80% of monsoon surplus) | 189271       |
| Available for Agriculture from Ground water                       | 155001       |
| Surface water available from SWB                                  | 5000         |
| Surface water available from drains                               | 216000       |
| Total water available(surface-ground water)                       | 376901       |
| Water Demand                                                      | 1200000      |
| Surplus (sum)                                                     | 0            |
| Deficit                                                           | 823099.0     |

Deficit:823099.0 Surplus:0

Crop Water Budgeting(FES)

page 1

Balance making for OCT\_APR Revised  
Hadgud,ANAND,ANAND ,GUJARAT

← GUJARAT\_ANAND \_A...

Crop Water Budgeting(FES)

page 1

Balance making for OCT\_APR Revised  
Hadgud,ANAND,ANAND ,GUJARAT

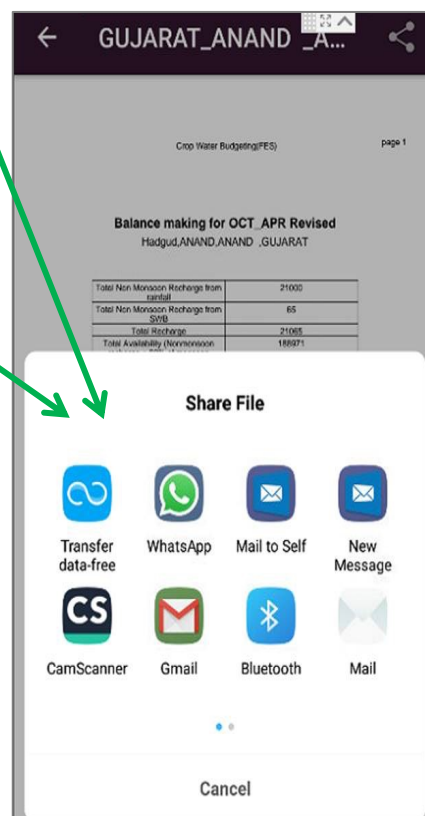
|                                                                   |              |
|-------------------------------------------------------------------|--------------|
| Total Non Monsoon Recharge from rainfall                          | 21000        |
| Total Non Monsoon Recharge from SWB                               | 65           |
| <b>Total Recharge</b>                                             | <b>21065</b> |
| Total Availability (Nonmonsoon recharge + 80% of monsoon surplus) | 189271       |
| Available for Agriculture from Ground water                       | 155001       |
| Surface water available from SWB                                  | 5000         |
| Surface water available from drains                               | 216000       |
| Total water available(surface-ground water)                       | 376901       |
| Water Demand                                                      | 170000       |
| Surplus (sum)                                                     | 206901.0     |
| Deficit                                                           | 0            |

Deficit:0 Surplus:206901.0

Crop Water Budgeting(FES)

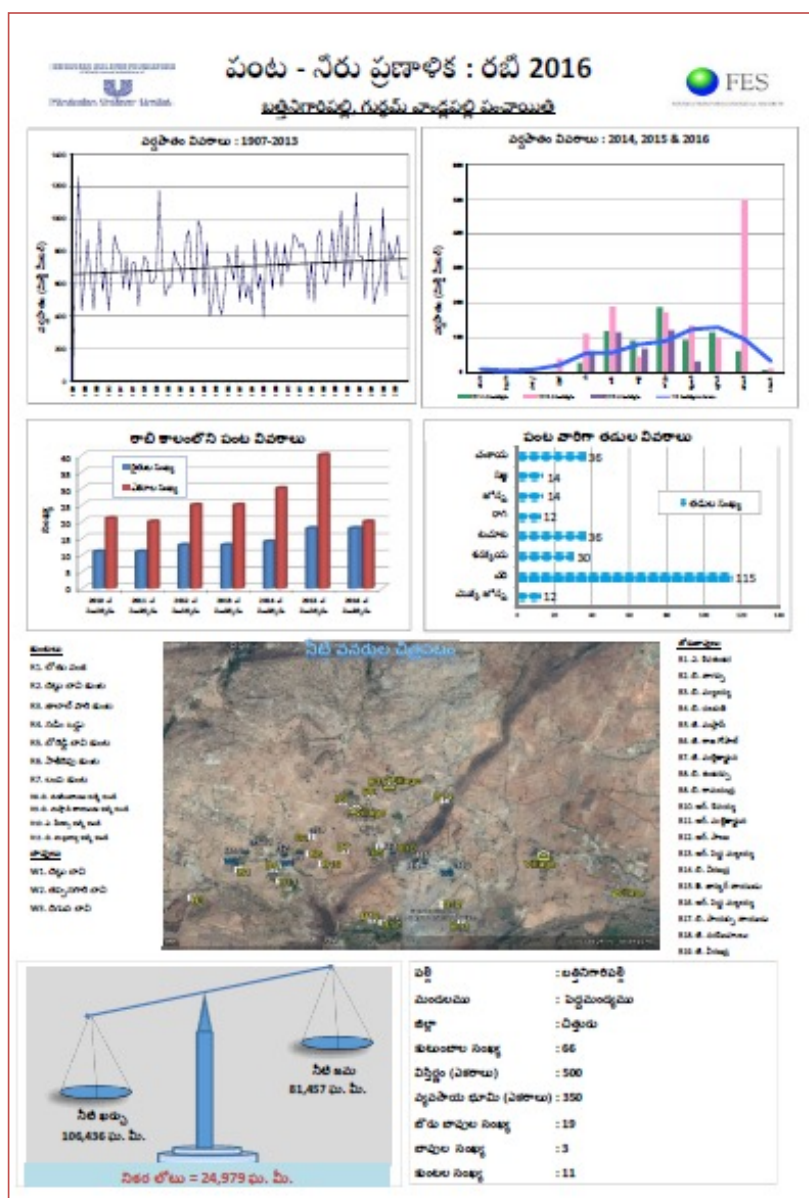
page 2

Balance making for OCT\_APR Revised  
Hadgud,ANAND,ANAND ,GUJARAT



## Dashboard preparation & presentation before the community

The PDFs generated after sheet no. 9 or 8 i.e. report card with water balance is printed on chart or flex sheet along with other charts i.e. rainfall pattern, cropping pattern, crop wise irrigation requirement and details of wells & tube wells over last 30-40 years; water resource map etc. as shown below-



This dashboard is now presented before the community to trigger the discussion around the water & crops.

### What is expected from the discussion?

The expectations regarding irrigation water management from the discussion amongst the community are-

- To change their crop plan for the Rabi season
- To change cropping practices & irrigation methods
- To evolve rules & regulations for usage of water.

If there is change in crops/ and practices, the revised crop plan is filled in the Sheet no. 10 or 9 and we would get the estimation of total water available & revised requirement for Rabi season in the next sheet i.e. sheet no. 11 or 10, which would also be depicted in pictorial form and developed as flex sheet or chart.

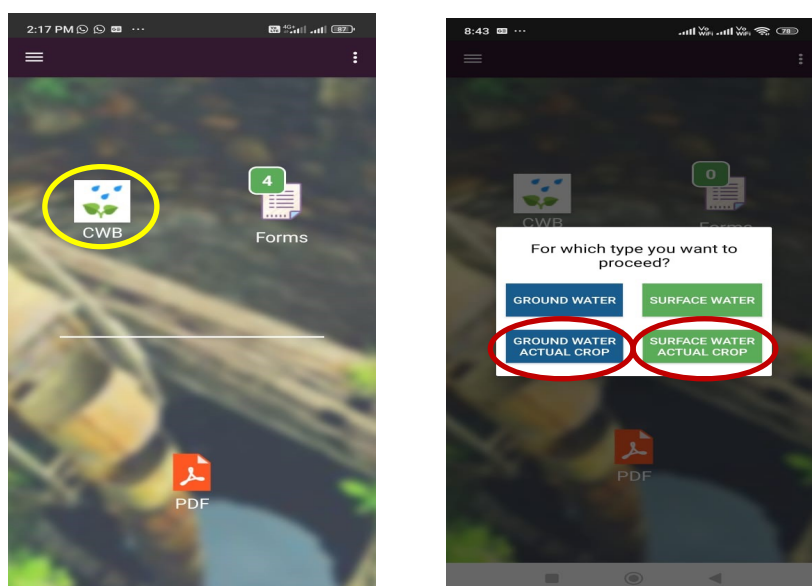


The dashboard & sheet/ chart depicting revised crop plan should be hanged or pasted at any common place where all of the villagers can see and discuss around the issues presented.

## Data collection of actual crops grown

Once the crops are grown and crops are in the maturity phase i.e. during Feb-April (depending upon the crop cycle), data for actual crops grown and water applied in those crops are taken. This data is used to analyse the impact of CWB in terms of change in cropping pattern, irrigation management etc. by the farmers.

For feeding the data in the CWB app, one has to click on CWB icon as shown in yellow circle in the picture below. Once the CWB icon is clicked, 4 options are shown on the screen and one has to select either 3rd (GROUND WATER ACTUAL CROP- if ground water based CWB has been done in that particular village) or 4th (SURFACE WATER ACTUAL CROP- if surface water based CWB has been done in that particular village).



After selecting the right option, a form would open in which one has to fill the basic information of that particular village for which the actual crops grown & water usage data are to be filled.

The image shows a screenshot of a data collection form within the CWB app. The form has a dark blue header with a white back arrow on the left. Below the header, there are several dropdown menus with green labels: 'Data Collection Type' (with 'Testing' selected), 'State' (with 'Gujarat' selected), 'District \*' (with 'Anand' selected), 'Block \*' (with 'Anand' selected), 'Village \*' (with 'Adas' selected), and 'Financial year \*' (with '2024-25' selected). At the bottom of the form, there is a dark blue button with the word 'SUBMIT' in white capital letters. The background of the form is a dark blue gradient.

Once the basic details of the village are feed, the below depicted form would open and the data of actual crops grown & irrigation applied during Rabi season to be filled in the sheet.

8:54 Vo WiFi Vo WiFi 77

←

**Estimation of water usage for actual rabi crops**

**October to April**

S. No. 1

Name of the irrigated crop

Enter Value

Method of irrigation

Select Value

No. of farmer

Enter Value

Area under Crop (Ha)

Enter Value

No. of irrigation

Enter Value

Pumping hours/ irrigation

Enter Value

Discharge rate of irrigation pump (litres/ hour)

Enter Value

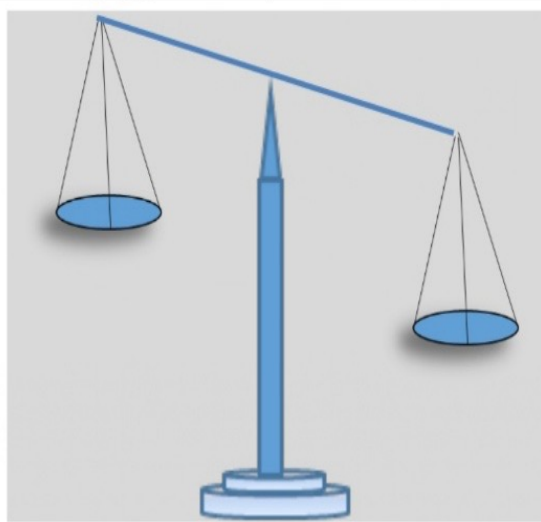
**Calculate**

Once the data of actual crops grown & irrigation is filled and submit the data, again a report with balance would be prepared and generated in PDF also. This PDF can be shared via email, WhatsApp, Bluetooth etc. as earlier ones and one can compare the farmers' own crop plan before CWB, revised crop plan after CWB and actual crops grown by the farmers.

## Actual\_Ground\_Balance making for actual crop grown

Dabhasi,Borsad,Anand,Gujarat

|                                                     |            |
|-----------------------------------------------------|------------|
| Total Ground Water available for agriculture        | 345808     |
| Surface water available in SWB                      | 20000      |
| Surface water available in DRAINS                   | 864000     |
| Total Surface Water available                       | 884000.00  |
| Total Water Available                               | 1229808.00 |
| Total Water Demand-                                 | 960000     |
| Total Cultivated area (Hectare)                     | 250        |
| Total area to be cultivated in Rabi Season(Hectare) | 150.0      |
| % area to be cultivated under rabi season           | 60.00      |
| Surplus (cuM)                                       | 269808     |
| Deficit                                             | 0          |

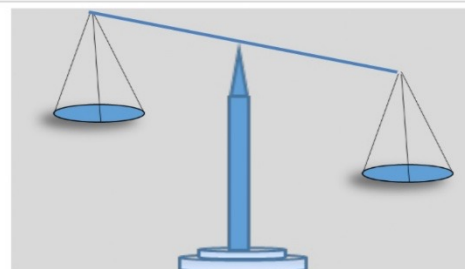


Crop Water Budgeting(FES)

## Actual\_Surface\_Balance making for actual crop grown

Bhichor,Fatepura,Dohad,Gujarat

|                                                                   |       |
|-------------------------------------------------------------------|-------|
| Available for Agriculture from Ground water                       | 44960 |
| Utilized Surface water available from WHS                         | 0     |
| Un-Utilized Surface water available from WHS                      | 0     |
| Utilized Surface water available from drains                      | 0     |
| Un-Utilized Surface water available from drains                   | 0     |
| Total utilized water available(surface+ground water)              | 44960 |
| Total un-utilized available(surface+ground water)                 | 0     |
| Total water available (utilized + un-utilized)                    | 44960 |
| Water Demand                                                      | 0     |
| Total Cultivated area                                             | 200   |
| Total area to be cultivated in Rabi Season                        | null  |
| % area to be cultivated under rabi season                         | 0     |
| Surplus- with Total utilized water available(cuM)                 | 44960 |
| Deficit- with Total utilized water available(cuM)                 | 0     |
| Surplus- with Total water (utilized + un-utilized) available(cuM) | 44960 |
| Deficit- with Total water (utilized + un-utilized) available(cuM) | 0     |



| (Usable+ Non usable)                                                  |                                                                           |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------|
| Deficit                                                               | Surplus                                                                   |
| Deficit- with Total utilized water available(cuM)<br>0                | Surplus- with Total utilized water available(cuM)<br>44960                |
| Deficit- with Total water(utilized + un-utilized) available(cuM)<br>0 | Surplus- with Total water(utilized + un-utilized) available(cuM)<br>44960 |

Crop Water Budgeting(FES)

It would give the clear insight about the adoption of revised/ recommended crops & irrigation methods by the farmers and water savings due to those adoptions.

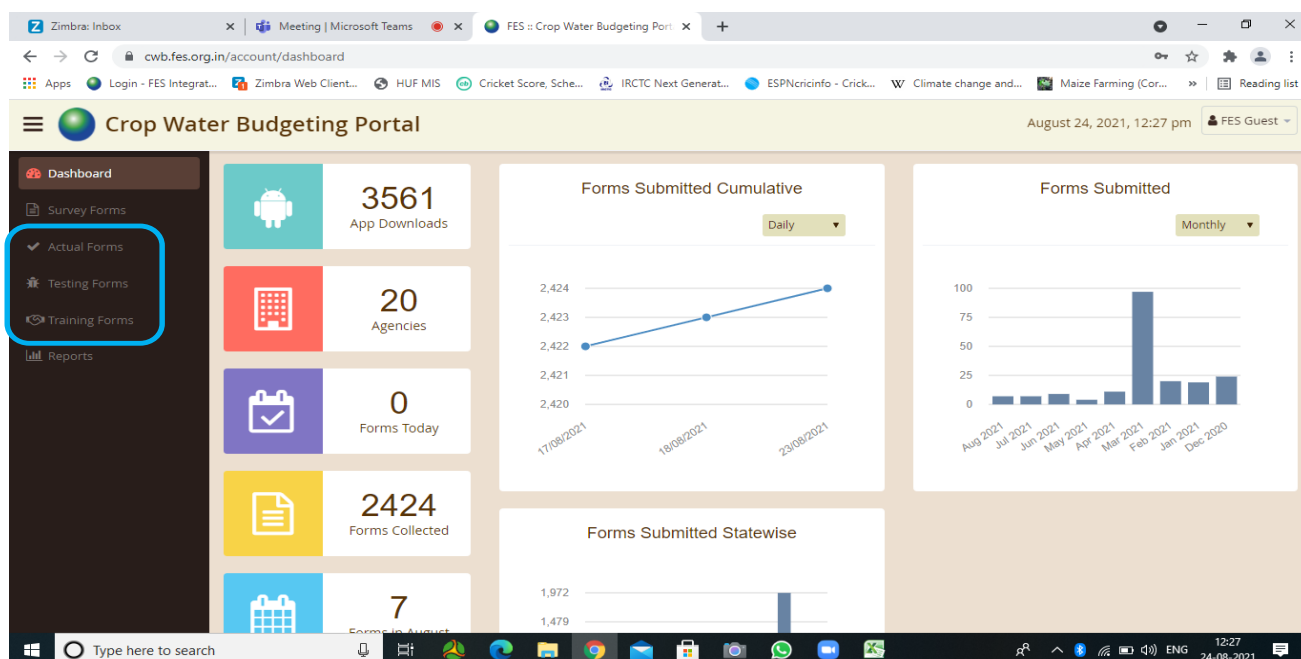
## Accessing the CWB portal & generating reports

Once the <https://cwb.fes.org.in> is logged in, the below mentioned page will open. In this page, on the left side, there are buttons for Actual Forms, Testing Forms & Training Forms as shown in the blue box and relevant forms can be accessed from here by clicking on any of the three.

Please note that the CWB Portal is an open-access platform. The User ID and Password required to log in to the portal are provided below:

User ID- guest

Password- guest2018



For example, if Actual Forms is clicked, below mentioned page depicting the list of all the Actual Forms would be opened.

The screenshot shows the 'Actual Forms' page. The table lists the following columns: No., ID, Type, Name, Phone, Organization, App Version, State Name, District Name, Block Name, Village Name, Survey Date, Status, and Action. The table contains 25 entries, with the first few rows showing data for Gujarat and Telangana. The 'Status' column shows 'Partial' and 'Completed' entries. The 'Action' column includes icons for edit, delete, and download. A green box highlights the search filters, and a red box highlights the download icon in the action column.

| No.  | ID | Type         | Name              | Phone      | Organization                          | App Version | State Name  | District Name     | Block Name       | Village Name                 | Survey Date            | Status    | Action     |
|------|----|--------------|-------------------|------------|---------------------------------------|-------------|-------------|-------------------|------------------|------------------------------|------------------------|-----------|------------|
| 9819 |    | Ground Water | inayatkhon pathan | 9033565694 | Reliance Foundation                   | 18          | Gujarat     | Rajkot            | Jasdan           | Ishvariya                    | 27-07-2023 05:16:13 pm | Partial   | [Download] |
| 9818 |    | Ground Water | inayatkhon pathan | 9033565694 | Reliance Foundation                   | 18          | Gujarat     | Rajkot            | Jasdan           | Gundala Jam                  | 27-07-2023 04:34:10 pm | Partial   | [Download] |
| 9817 |    | Ground Water | inayatkhon pathan | 9033565694 | Reliance Foundation                   | 18          | Gujarat     | Rajkot            | Jasdan           | Ramparda                     | 27-07-2023 12:51:38 pm | Partial   | [Download] |
| 9816 |    | Ground Water | inayatkhon pathan | 9033565694 | Reliance Foundation                   | 18          | Gujarat     | Rajkot            | Jasdan           | Jasapar                      | 27-07-2023 12:23:36 pm | Partial   | [Download] |
| 9815 |    | Ground Water | inayatkhon pathan | 9033565694 | Reliance Foundation                   | 18          | Gujarat     | Rajkot            | Jasdan           | Raja Vadla Jam               | 27-07-2023 11:55:00 am | Partial   | [Download] |
| 9814 |    | Ground Water | Veresham U        | 7989274918 | Reliance Foundation                   | 18          | Telangana   | OTHER (Kamareddy) | OTHER (Bhiknur)  | OTHER (Sidharameshwar Nagar) | 26-07-2023 11:13:00 am | Completed | [Download] |
| 9813 |    | Ground Water | Veresham U        | 7989274918 | Reliance Foundation                   | 18          | Telangana   | OTHER (Kamareddy) | OTHER (Rajampet) | OTHER (Arepally)             | 24-07-2023 10:54:05 am | Completed | [Download] |
| 9812 |    | Ground Water | Remeswar Todsam   | 9657058273 | Vikasganga Samajsevi Sanstha Ghatanji | 18          | Maharashtra | Yavatmal          | Ghatanji         | Belora                       | 22-07-2023 04:08:07 pm | Completed | [Download] |
| 9810 |    | Ground Water | Remeswar Todsam   | 9657058273 | Vikasganga Samajsevi Sanstha Ghatanji | 18          | Maharashtra | Yavatmal          | Arni             | Asara                        | 22-07-2023 03:52:20 pm | Completed | [Download] |

There are options for filtering the forms by Type of CWB, User Name, Mobile number, Organization, State, District, Block etc. as shown the above screen in green box. One can filter from here as per his/her need. Also there is facility to download the individual form by clicking on the Excel icon at the right most side of any of the form as surrounded by the red colour box in the above picture.

Also there are two icons viz. “Partial” & “Complete” in the right side of forms as surrounded by blue circle. The “Partial” represents the forms, which are not completed yet and only 9 or 8 sheets in case of “GROUND WATER” or “SURFACE WATER” respectively up to the “Estimation of Water Requirement for Rabi Season- Farmers Own plan” have been filled.

The “Complete” represents that all the sheets including the Revised Estimation of Water Requirement for Rabi Season” have been filled with photographs etc.

In the left side there is another option of “Reports” as surrounded in the red colour box. From here, one can see and download the reports of CWB done during any specific period by filtering by dates as shown in yellow colour box. There would be two options opened, once the “Reports” is clicked i.e. Surface Water & Ground Water and whatever type of CWB have been done for any respective area (State/ District/ Block) or Organization, could be selected here and accordingly reports would be generated. There is an icon i.e. “Download XL” on the upper side surrounded in blue colour box in the screen below and by clicking on that, the filtered report would be downloaded in Excel form with various parameters.

The screenshot displays the 'Crop Water Budgeting Portal' interface. The left sidebar contains a 'Reports' section, highlighted with a red box, with sub-options for 'Surface Water' and 'Ground Water'. Below this is a 'Filter records' section, highlighted with a yellow box, containing 'From Date' and 'To Date' input fields, and 'Filter' and 'Reset' buttons. The main content area shows a 'Surface Water Summary' table with a 'Download XL' button highlighted in a blue box. The table has columns for various parameters including Survey ID, State, District, Block, Village, Organization, Date, No. of Irrigation wells (Open), Total Ground water recharge in open wells, No. of Irrigation tube wells, Total Ground water recharge in tube wells, Balance or Availability, No. of Irrigation wells (Open), Total Ground water recharge in open wells, and No. of Irrigation tube wells. The table displays two rows of data.

| Sr. No. | Survey ID | State  | District  | Block      | Village   | Organization        | Date                   | No. of Irrigation wells (Open) | Total Ground water recharge in open wells | No. of Irrigation tube wells | Total Ground water recharge in tube wells | Balance or Availability | No. of Irrigation wells (Open) | Total Ground water recharge in open wells | No. of Irrigation tube wells |
|---------|-----------|--------|-----------|------------|-----------|---------------------|------------------------|--------------------------------|-------------------------------------------|------------------------------|-------------------------------------------|-------------------------|--------------------------------|-------------------------------------------|------------------------------|
| 1       | 9799      | Odisha | Kalahandi | Golamunda  | Kuresiuni | Reliance Foundation | 18-07-2023 11:03:42 am | 30                             | 544500                                    | 4                            | 96800                                     | 634765                  | 30                             | 72000                                     | 4                            |
| 2       | 9798      | Odisha | Kalahandi | Dharamgarh | Kirkakani | Reliance Foundation | 18-07-2023 09:57:27 am | 16                             | 284544                                    | 12                           | 267520                                    | 548988                  | 16                             | 36270                                     | 12                           |

Showing 1 to 25 of 2,556 entries

**For more Information, please contact**

Rajesh Kumar Mittal  
rajesh.mittal@fes.org.in  
8160201827

Snehal Tadv  
snehal.tadvi@fes.org.in  
8141776799





FOUNDATION FOR ECOLOGICAL SECURITY

PB No. 29, Anand 388 001, Gujarat, India.

Landline: 9687606949, 9099798454

Email: [ed@fes.org.in](mailto:ed@fes.org.in)

[www.fes.org.in](http://www.fes.org.in)

