



Specialized Expert System for Agro-Meteorological Early Warning (SESAME)

Expert Users Guide version 2.0

July 2020

*Produced under the project Strengthening climate information and early warning systems in Cambodia
to
support climate resilient development and adaptation to climate change*

Specialized Expert System for Agro-Meteorological Early Warning (SESAME)

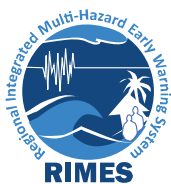
Users Guide

version 2.0

Developed by:

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*Produced under the project Strengthening climate information and early warning systems in
Cambodia
to
support climate resilient development and adaptation to climate change*



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PART 1 - INTRODUCTION TO SESAME

1. Overview

Agricultural Sector is one of the key climate-sensitive sectors in RIMES Member and Collaborating States and it is remained as the main livelihood of the population and backbone of the nations' economy. Farming decisions, from land preparation and crop selection to timing of planting, fertilizer application, pest management, irrigation, harvesting, and production, transportation and storage, could be guided by weather forecasts that are highly reliable, site-specific, and with a lead time of at least 10 days, to optimize benefits from a good weather, or manage weather-related risks.

The Regional Integrated Multi-Hazard Early Warning System (RIMES) work in capacity development is steered by user requirements, for ensuring relevance of the evolution of NMHS' products and services. The capacity development process is integrated into NMHSs, partner national and sub-national sectoral institutions, and communities, for ensuring sustainability.

A common demand from farmers in various RIMES Member and Collaborating States is the development of an integrated tool that facilitates timely, relevant, and actionable agrometeorological bulletins for informing agricultural plans and decisions. These farmer requirements guided the inception and development of SESAME.

SESAME was developed with the end-in-view of responding to farmers' requirements, for information resources and risks management, seasonally and sub-seasonally and it has been piloted in two locations in the dry zone of Myanmar and has been expended to other region in the country and RIMES member states recently. The tool can be available as computer based and mobile based system and this User Manual will assist the expert users in navigating Computer based SESAME's interfaces and in operating the system

1.1 System Design

SESAME is a web based tool and it integrates a) long-term location-specific¹ historical climate data, for training the model vis-a-vis local climate; b) local soil characteristics, soil suitability, topography and agriculture support systems (e.g. proximity to river, availability of irrigation system), for understanding local geo-physical characteristics relevant to agriculture; c) key crops, cropping pattern, cropping calendar, crop sensitivities to climate parameters, decision calendar, and agricultural practices, for training the system on decision making process for particular crop and crop stages in different locations; and d) regularly updated location-specific climate information of various timescales (i.e. 3 days forecast, updated daily; 10 days forecast, updated every 5 days; monthly forecast, updated every month; and seasonal forecast, updated every month).

¹ In this case, location specific means province/district level for Cambodia

1.2 Inputs

Figure 1.1 presents the system design. Web-based front-end modules are built using Model View Controller (MVC) architecture, served by MySQL database. Weather and climate data analysis and processing are done mostly in Perl, shell script, GrADS, ImageMagick, and generic mapping tools.

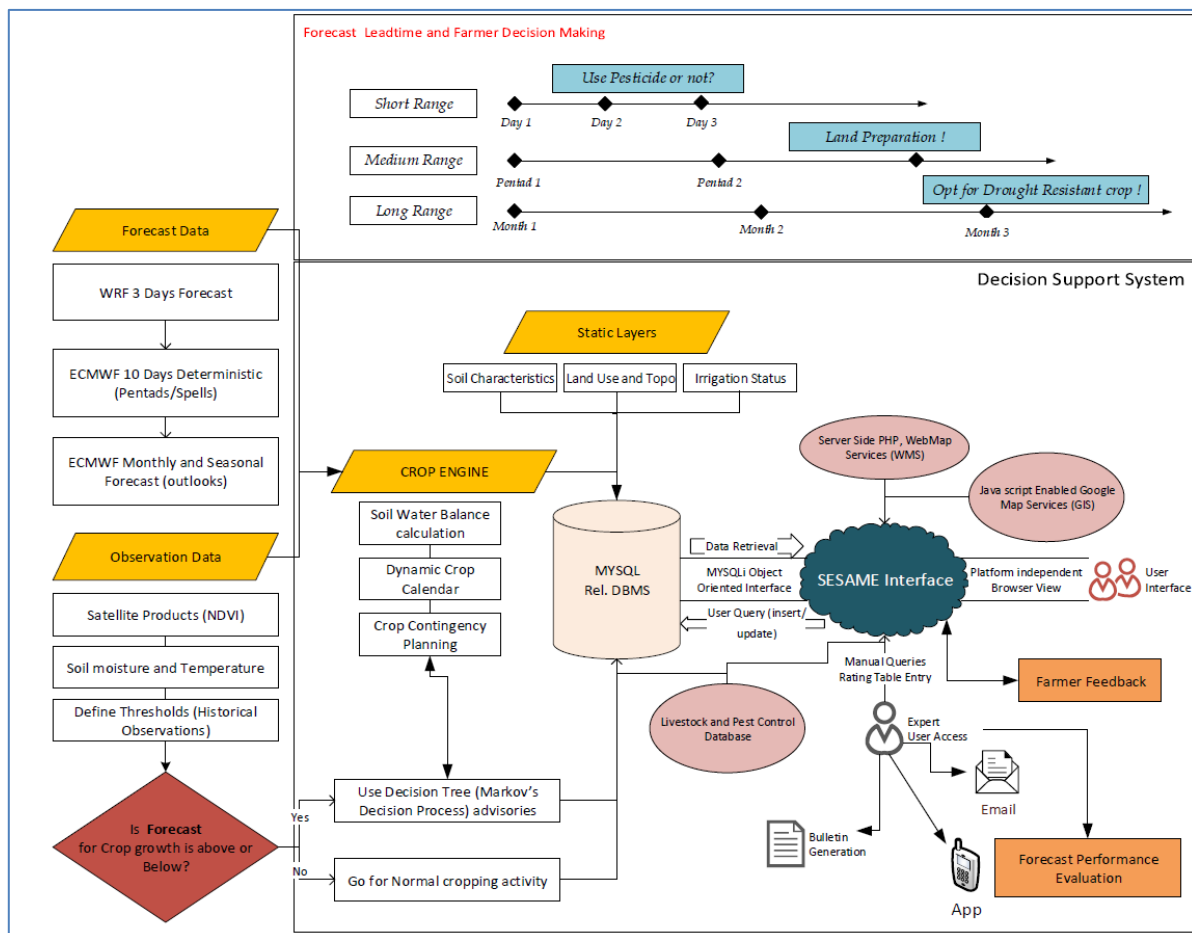


Figure 1.1 SESAME System Design

Currently, the system’s geospatial agro-climatic database consists of:

- Static layers of monthly normal climate, soil, terrain, land use, and population density data
- Dynamic layers of weather observation and forecast data

Forecast data used are 10-day deterministic weather forecast from the European Centre for Medium-Range Weather Forecasts (ECMWF), and 3-day weather forecast from RIMES Weather Research and Forecasting (WRF) model that is customized for the member states².

² Currently the system is customized for seven RIMES member states: Myanmar, Sri Lanka, Cambodia, Papua New Guinea (PNG), Fiji, Samoa and India.

The 10-day forecast, at 0.5degree x 0.5degree resolution, comprises of maximum and minimum temperatures, precipitation, wind speed and direction, and relative humidity derived from temperature and dew point temperature data. Grid-scale precipitation, temperature, and potential evapotranspiration (PET) are generated on dekadal (10-day) basis. Wind speed and minimum and maximum temperature are averaged over daily values; rainfall and PET are accumulated daily values. PET is a derived parameter, computed using Hargreaves Method (refer to Annex 1). Forecast is formulated over the 14 station grid points, area-averaged to cover the pilot sites. The 3-day WRF forecast at 9km x 9km resolution includes daily minimum and maximum temperatures, wind speed and direction, relative humidity, and precipitation, and are based on initial and boundary conditions from Indian Meteorological Department Global Forecast System (IMD GFS). Dekadal rainfall normal values are computed and are used for qualitative analysis of the dekadal forecast.

The system also incorporates crop-weather calendars (Figure 1.2) for prioritized crops of the country for correlating dekadal weather parameters with crop stage.

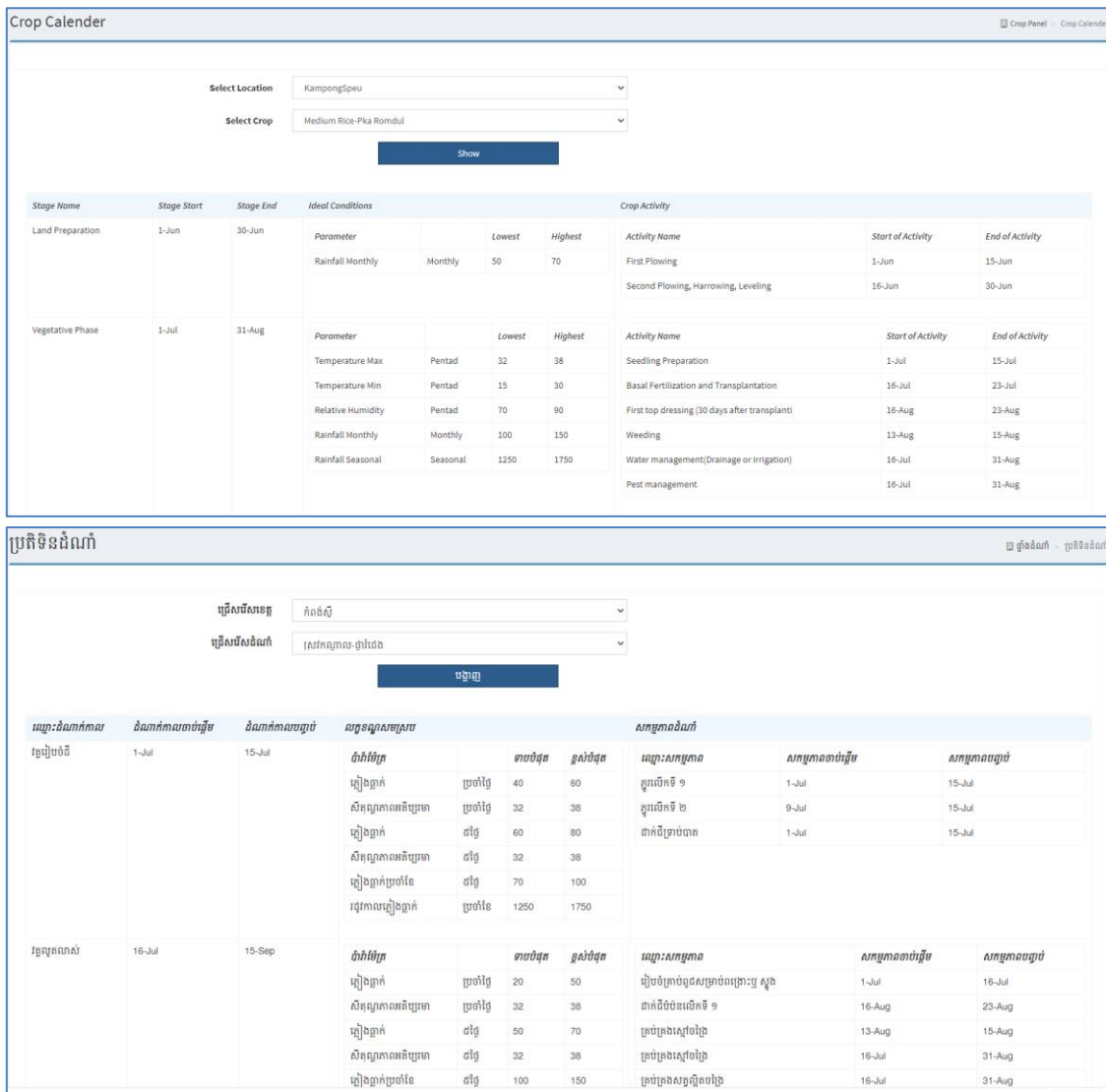


Figure 1.2 Crop-weather calendar

1.3 Outputs

The system provides the following outputs:

- a) 3-day and 10-day weather forecast
- b) Dekadal agro-meteorological bulletins for the pilot sites
- c) Location and crop specific agro-advisories for the pilot sites

The user interface provides a platform for visualization and analysis of weather and climate data, and generation and dissemination of forecast, bulletins, and advisories to users.

The web-based tool now supports dual language support for both on the interface and in the advisory generation process. User can choose and toggle between the Khmer and English language.



PART 2 - EXPERT USER GUIDE

This user guide will assist SESAME expert admin user both from National Meteorological and Agricultural Representatives

1. to check weather outlook for the locations,
2. to create crop calendar,
3. to generate agro-climatic bulletin,
4. to disseminate the information, and
5. to monitor user feedback.

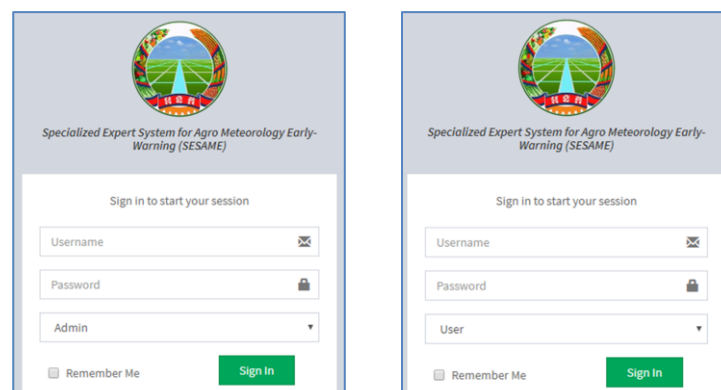
Note: The following session describes the utility and accessibility of computer-based system and it is a working manual as system are improving per feedback from the multiple stakeholders.

2. User Access and Overview

2.1 User Access

SESAME can be accessed at http://sesame-khm.rimes.int/index.php/login/login_form and Log in details will be provided by the Web Administrator. There are two types of user roles:

- a) **Admin Users:** have full access and control over the system, as well as update the system
- b) **General Users:** can only view, and send feedback, they cannot access or modify any other content of the system.



The figure displays two side-by-side screenshots of the SESAME login page. Both pages feature the SESAME logo at the top, which includes a globe and a green field. Below the logo, the text reads "Specialized Expert System for Agro Meteorology Early-Warning (SESAME)". The main content area is titled "Sign in to start your session". The left screenshot shows the login form for Admin Users, with a dropdown menu set to "Admin". The right screenshot shows the login form for General Users, with a dropdown menu set to "User". Both forms include fields for Username, Password, and a Sign In button. There is also a "Remember Me" checkbox on both pages.

Figure 2.1 Log-in page for Admin Users (left) and General Users (right)

2.2 Overview Panel

The user default lands in overview page after logging in, which shows a forecast visualization platform superimposed on the Google map server. By default, the system shows Day 1 Rainfall Forecast from the RIMES WRF model for entire country and the Map shows the amount of rainfall expected to fall in the next 24 hours for the provinces in a color-coded format. In the overview page, the system provides four kinds of information products: 3-day

forecast, 10-day forecast, monthly and seasonal of provinces in the country. For Cambodia, 3-day and 10-day forecast is available meanwhile for provinces.

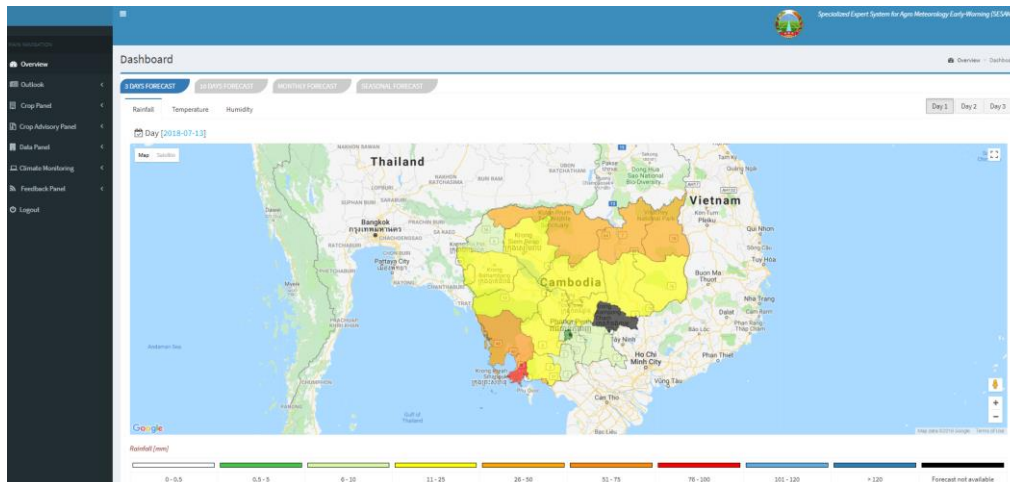


Figure 2.2 (a) Overview Panel

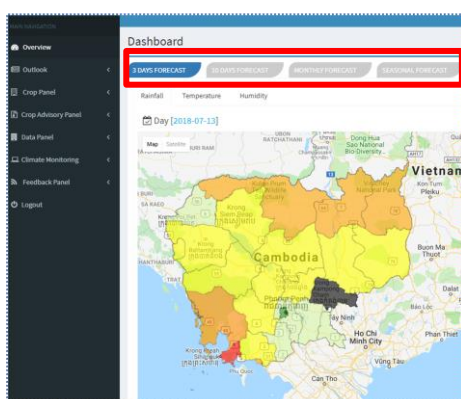


Figure 2.2 (b) Overview Panel

The left side vertical menu bar provides access to all the modules to easily navigate between them. For example, user can move directly from overview page to crop advisory section or climate monitoring panel and move back to the original page quickly. The horizontal main menu at the top of the overview page shows tabs to choose between different forecast time scales e.g. “3 Days Forecast”, “10 Days Forecast”, while the sub menu shows different parameters to choose from e.g. Rainfall, Temperature, Humidity etc. as shown in the Figure 2.2.

The extreme right corner shows the corresponding models individual days forecast. For instance, as the 3 days forecast’s lead time is for 72 hours, so the menu shows option for Day 1 (depicts 24h); Day 2 (depicts 48h-24h) rainfall and Day 3 (depicts 72h-48h) accumulated rainfall respectively. The scalebar at the bottom of the page suggests the quantity of rainfall expected, measured in millimeter (mm). Similarly, the Day 1, Day 2 and Day 3 for the Temperature and the Humidity depicts averaged temperature and relative humidity for 24h, 48h and 72h. The scalebar at the bottom of the pages shows the temperature (in degree Celsius) and humidity (in percentage).

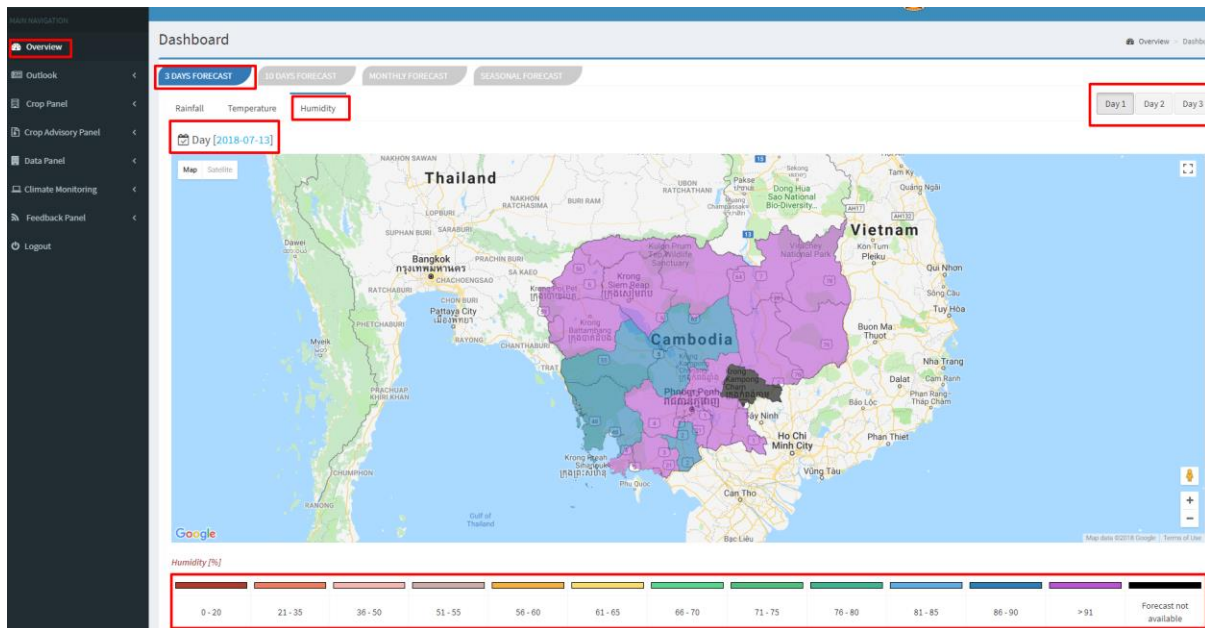


Figure 2.2 (c) Overview Panel

3. Outlook Panel >> Weather Forecast

The **Outlook** page provides access to see the location specific forecast information. The forecasts for the townships are precomputed and stored in the database. The user needs to select from the list of the townships available from the dropdown menu as shown in Figure 3.1. The system retrieves the information from the database for the selected township.

3.1 WRF 3 Days Forecast [RIMES]

The first section shows the forecast for the next 3 days with the dates clearly mentioned in the first column followed by the forecast parameters: rainfall amount, humidity, maximum, average and minimum temperature and windspeed. The section also shows forecast from the past 3 days, which can later be replaced by the station observation data.

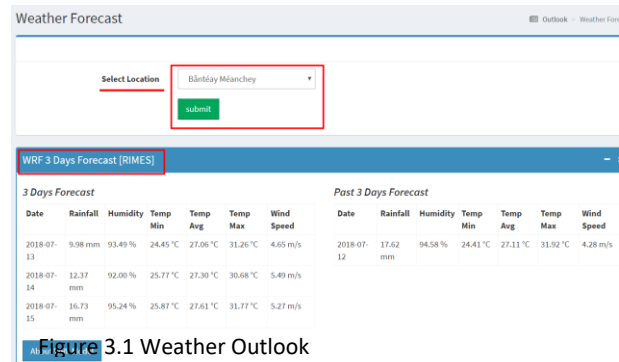


Figure 3.1 Weather Outlook

The **About WRF** button shows information about the WRF model and the customization process.

3.2 ECMWF Deterministic 10-day, Monthly and Seasonal Outlook

ECMWF Deterministic Forecast will provide 10-day forecast for specific location. Forecast is divided into two Pentad and it gives forecast for accumulated rainfall amount, average

humidity, minimum and maximum temperature, rainy day and spell³ condition for five days each. The section also shows ECMWF Monthly and Seasonal Outlook and it provides rainfall outlook if it is in wet season and temperature outlook if it is in dry season. Monthly and seasonal outlook for provinces will be updated when historical climate data are integrated to the system. Figure 3.1 describes ECMWF 10-day (11-20 July 2018), monthly (August 2018) and seasonal forecast (August, September, and October 2018) for Banteay Meanchey Province in Cambodia.

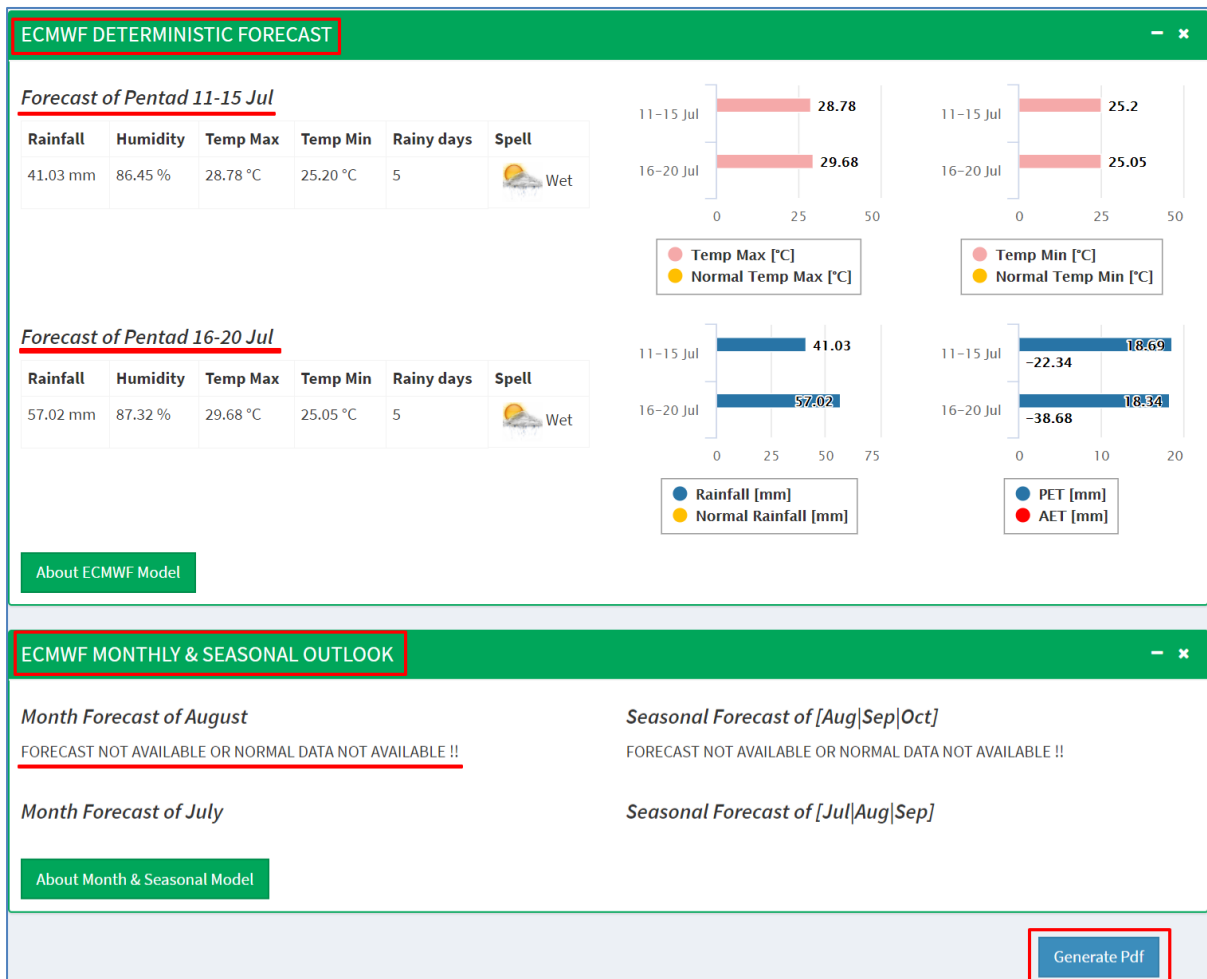


Figure 3.1 Forecast Parameters for the 10-day forecast

The generate pdf button is present at the bottom of the page to generate a document format representation of the information shown in the web page termed as bulletin. A detailed sample of the bulletin is presented in the Annex 1.

³ Respective National Meteorology Service Department or Agricultural Department has proper definition of rainy day and spell condition and the system will apply the information and calculate accordingly.

4. Crop Panel

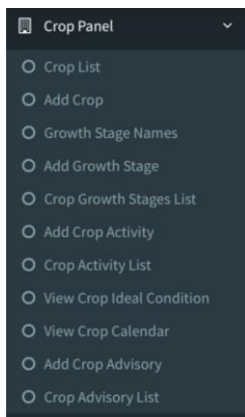



Figure 4.1 Crop Panel

As stated in introductory session of this manual, SESAME will provide agro-climatic bulletin and Crop Session is one of the key components for the system as it provides expert user to create crop calendar, forecast based advisories for specific crop at specific location. Therefore, this session intended for admin users from Agriculture Office representative from HQ, Provinces and District who are assigned to enter detail crop data; crop information, crop growth stages and activity, ideal weather condition per states and activity and advisory against threshold level of specific growth stages. Clicking to Crop Panel in the Expert User Interface displays the drop-down list as shown in Figure 4.1.

4.1 Add Crop and Crop List

The following steps show how to enter crop Information and review the crop list.

- Step 1 – Click **“Add Crop”** button in the drop down of Crop Panel
- Step 2 – Select the location (in this case, it is province location) and enter location name in the box
- Step 3 – Write down the crop name in the **“Crop Name”** box
- Step 4 – Enter **“Crop Variety”** in the box
- Step 5 – Set starting and ending time of the crop variety
- Step 6 – Click **“Save”** button
- Step 7 – If user want to edit the entered information, user can click **“Edit”**  as shown in Figure 4.2
- Step 7 – To review the information, please Click **“Crop List”** in the Drop Down of Crop Panel (Figure 4.2)

Please see Step 1 to 6 in Figure 4.1 and note that all required field must enter.

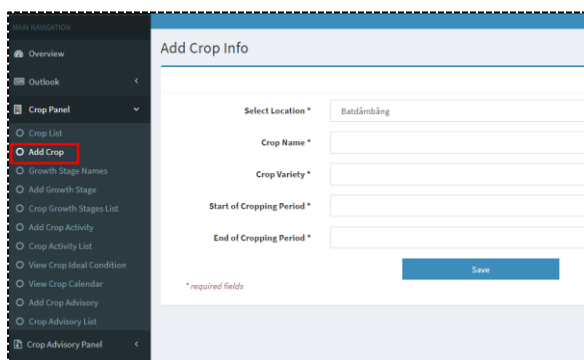


Figure 4.1 Add Crop Information

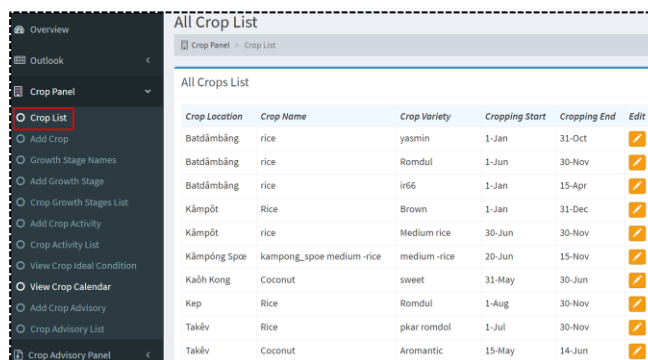


Figure 4.2 Crops List

4.2 Growth Stage Name, Add Growth Stage and View the Growth Stage

As the agro-climatic bulletins are based on growth stages of specific crop, this session provides user to enter growth stages of crop specific.

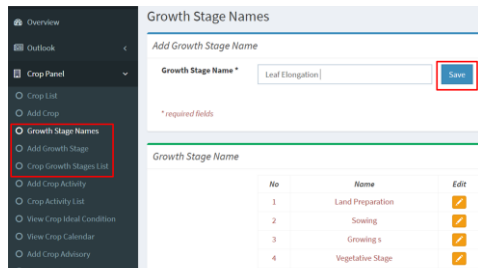



Figure 4.3 Add Growth Stage Name

First, user must check growth stage name by clicking to **“Growth Stage Names”** to make sure the stage names you wanted to enter are already included in the list. If Growth Stage Name is not yet in the list, user can type the stage name and click **“Save”** to add the name (Please see Figure 4.3 on the left- hand side).

After adding growth stage name, user can enter growth stages by doing the following steps.

- Step 1 – Click **“Add Growth Stage”** button in the drop down of Crop Panel
- Step 2 – Select crop name you entered by clicking to **“Crop Name”** (Crop Name are made as cropname-variety-province).
- Step 3 – Select **“Growth Stage Name”** of the crop
- Step 4 – Enter growth stage period (Start and End) in the box
- Step 5 – Check **“Required Forecast”** for growth stage of the crop by clicking the box
- Step 6 – Click **“Save”**
- Step 7 – To review the growth stages entered for the crop, click **“Crop Growth Stage View”** in the drop down of Crop Panel where you can also edit the information entered by clicking 

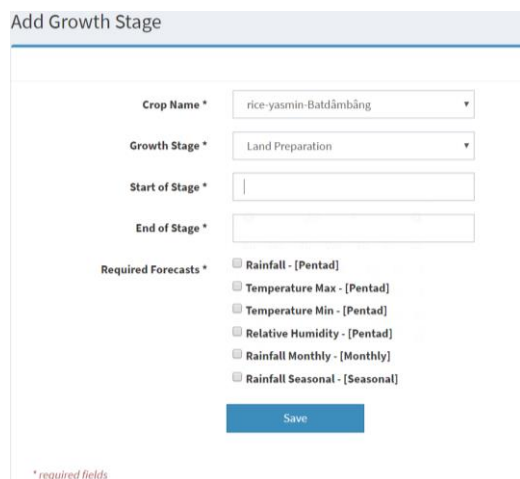


Figure 4.4 Add Growth Stage Information

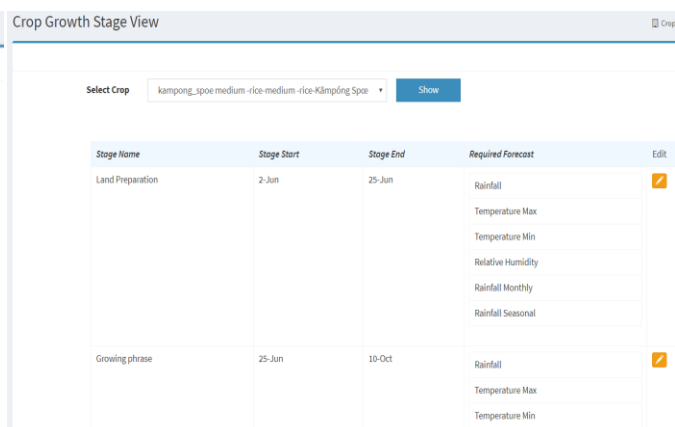



Figure 4.5 Crop Growth Stage View

4.3 Crop Activity and View Crop Activity List

The following steps provide user to enter activity of the crop at growth stage.

- Step 1 – Click **“Add Crop Activity”** in the drop down of Crop Panel
- Step 2 – Select Crop Name entered by clicking to drop down arrow of **“Crop Name”**
- Step 3 – Select growth stage of the crop by clicking to down arrow of **“Crop Growth Stage”** box
- Step 4 – Set the crop activity date by entering dates to **“Start of Activity”** and **“End of Activity”**
- Step 5 – Click **“Save”** if all information are entered.
- Step 6 – To view the activities entered, user can go to **“Crop Activity List”** as shown in Figure 4.7.
- Step 7 – To edit the information entered, user can click **“Edit”**  in the display of Crop Activity List

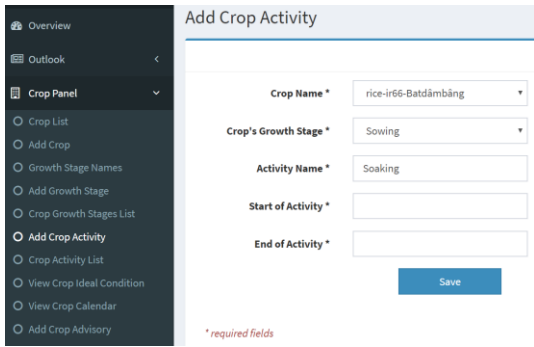


Figure 4.6 Adding Crop Activity

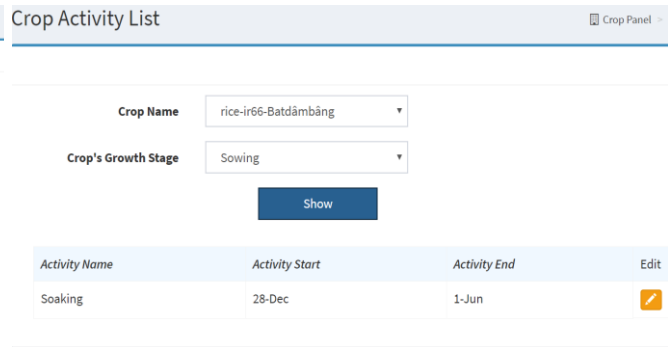


Figure 4.7 Review Crop Activity List

4.4 Adding Ideal Weather Condition of Crops and View Crop Calendar

First and foremost, user must click “**View Crop Ideal Condition**” under Crop Panel and “**Ideal Condition**” page will display as shown in Figure 4.8. When user clicks to the drop down arrow of “**Select Crop**”, then all entered crop list can be seen and user has to select one crop name and click “**Show**”. Crop name is displayed as “Crop Name – Variety – Location”.

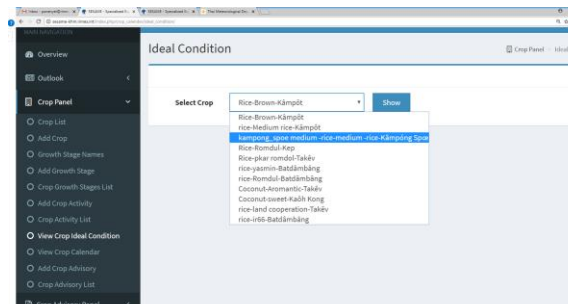


Figure 4.8 View Crop Ideal Condition

After clicking “**Show**” button, then Ideal condition of particular crop per growth stages is displayed as shown in Figure 4.9. Please note that the weather parameter in this ideal condition is linked to Forecast Requirement per growth stages you entered in “**Add Growth Stage**”. Ideal condition for each parameter is shown as “0” and user can set cursor in the box and enter the ideal condition (numerical values) of each parameter per stages and then click “**Update**”.

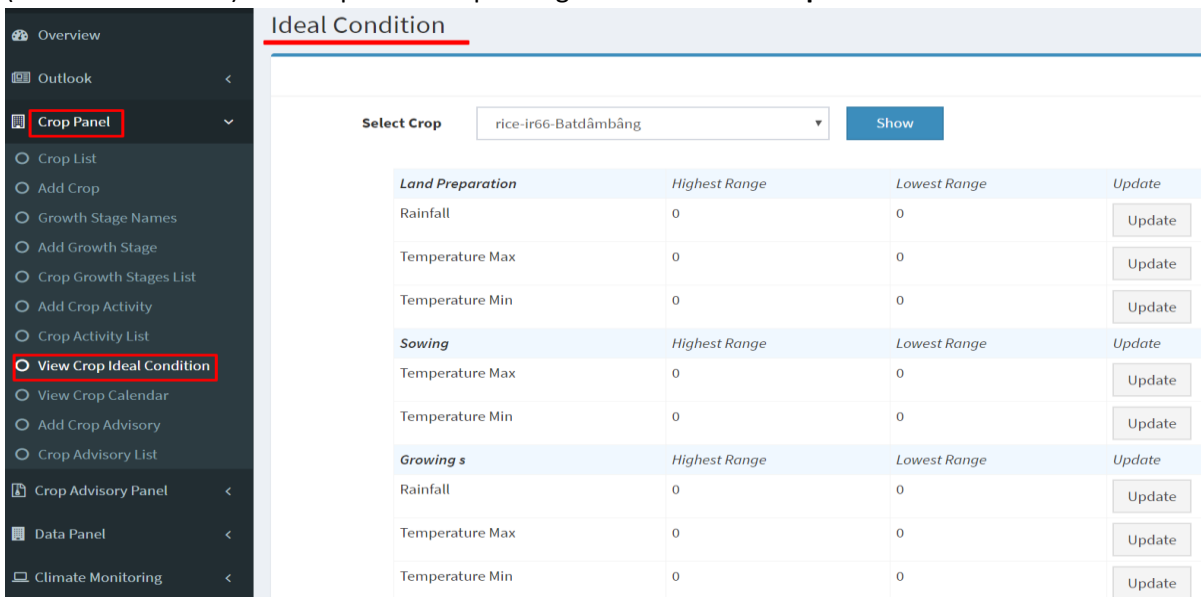


Figure 4.9 Ideal Condition of the Crop per growth stages

After entering crop information, user can check crop information entered collectively by clicking to “View Crop Calendar” under Crop Panel and then, select the crop by clicking to down arrow of “Select Crop”. Then information is displayed as shown in Figure 4.10.

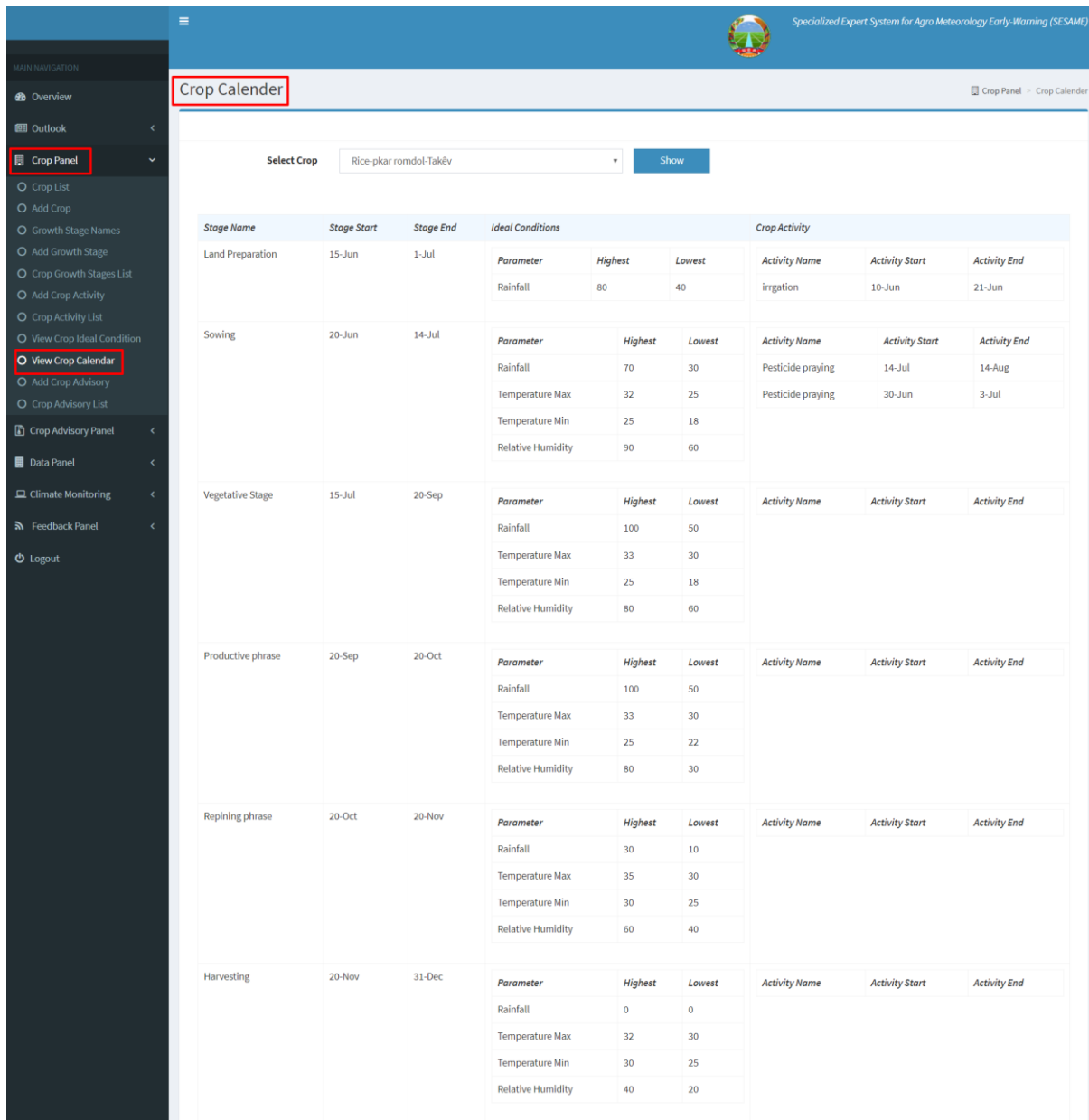


Figure 4.10 Crop Calendar for Rick in one Province of Cambodia

4.5 Add Crop Advisory and Crop Advisory List

This session provides user to add forecast based advisories for crop at particular growth stage. The following steps will guide user to enter advisory.

- Step 1 – Click **“Add Crop Advisory”** on Crop Panel.
- Step 2 – Select **“Crop Name”** (Cop Name–Variety–Location)
- Step 3 – Select the growth stage of the crop
- Step 4 – Select Forecast Parameter by clicking to **“Crops Required Forecasts”**
- Step 5 – Enter Advisory of the crop at particular growth stage and its parameter against the ideal weather condition (within, higher and lower than ideal condition)

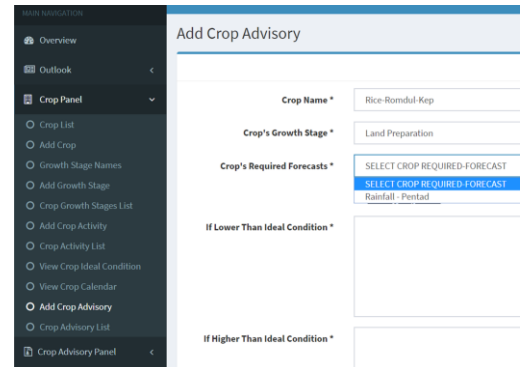



Figure 4.11 Add Crop Advisory

Step 6 – Click **“Save”** if all the required field are entered. User can follow the same steps for other growth stages and weather parameter of particular growth stage of the crop.

User can view the crop advisories by Clicking to **“Crop Advisory List”** and then select **“Crop Name”** and **“Crop’s Growth Stage Name”** in the drop down arrow. Please refer to Figure 4.12 below to see the crop advisory list for Vegetative Stage of RICE in TAKEV Province. There is edit option for admin user to make changes if needed and user can click to Edit  to edit the advisories.

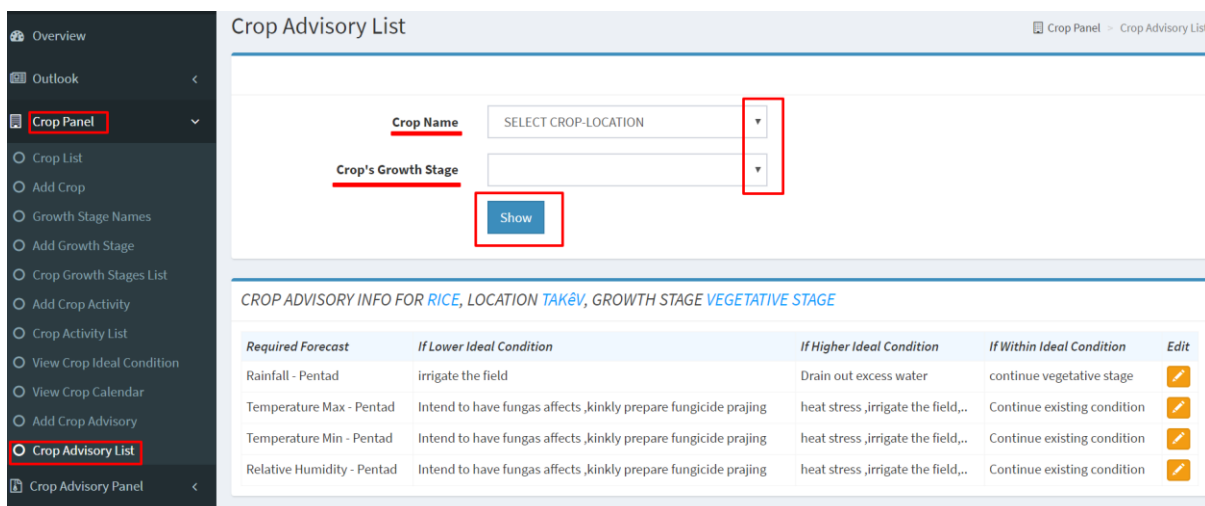
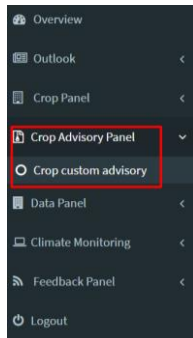


Figure 4.12 Crop Advisory List for Rice at Vegetative State in one province of Cambodia

5. Crop Advisory Panel >> Custom Crop Advisory



This session gives a perspective of reviewing advisories of the crop at different growth stages against the ideal weather conditions. While “Crop Advisory List” under Crop Panel gives advisories of the crop per one growth stage, this session provides user to see the custom advisories of the crop at all growth stages. In order to view it, user can click to “Crop Custom Advisory” under “Crop Advisory Panel”. Then user can select the crop name (Crop name is formatted as Crop Name – Variety – Location) and click “Submit” to display the custom crop advisory. Sample “Custom Crop Advisory for Rice (Variety Name – Pkar Romdol) for Takev District is shown in Figure 5.1. Please note that user can get advisories for the growth stages which are in current and next Pentad.

Crop Custom Advisory
Crop Advisory Panel > Crop Custom Advisory

CROP - VARIETY { Rice - pkar romdol }

DISTRICT { Takêv }

Growth stage information of crop

Crop Growth Stage	Start Stage	End Stage	Status	Status
Land Preparation	15-Jun	1-Jul	Land Preparation is not in current pentad.	Land Preparation is not in next pentad.
Sowing	20-Jun	14-Jul	Sowing is not in current pentad.	Sowing is not in next pentad.
Vegetative Stage	15-Jul	20-Sep	Vegetative Stage is in current pentad.	Vegetative Stage is in next pentad.
Productive phrase	20-Sep	20-Oct	Productive phrase is not in current pentad.	Productive phrase is not in next pentad.
Repining phrase	20-Oct	20-Nov	Repining phrase is not in current pentad.	Repining phrase is not in next pentad.
Harvesting	20-Nov	31-Dec	Harvesting is not in current pentad.	Harvesting is not in next pentad.

Generated custom advisory of crop for pentad { 16-20 Jul }

No custom crop advisory available for growth stage Land Preparation
 No custom crop advisory available for growth stage Sowing

The custom advisory generated for growth stage Vegetative Stage

The rainfall is likely to be above normal, it is advised to Drain out excess water
 The maximum temperature is likely to be below normal, it is advised to Intend to have fungus affects, kindly prepare fungicide praing
 The minimum temperature is likely to be normal, it is advised to Continue existing condition
 The relative humidity is likely to be above normal, it is advised to heat stress ,irrigate the field,...

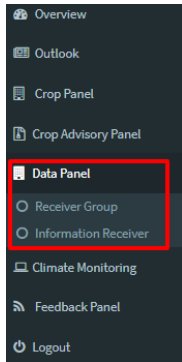
No custom crop advisory available for growth stage Productive phrase
 No custom crop advisory available for growth stage Repining phrase
 No custom crop advisory available for growth stage Harvesting

Generated custom advisory of crop for pentad { 21-25 Jul }

No Custom advisory available ! No custom crop advisory available for growth stage Productive phrase
 No custom crop advisory available for growth stage Repining phrase
 No custom crop advisory available for growth stage Harvesting

Figure 5.1 Custom Crop Advisory for Rice in Takev District

6. Data Panel



This session provides user to add receiver groups to disseminate Agro-Climatic Bulletin via email and SMS. First of all, user has to create Receiver Group in the system. The following steps guide user to create Receiver Group;

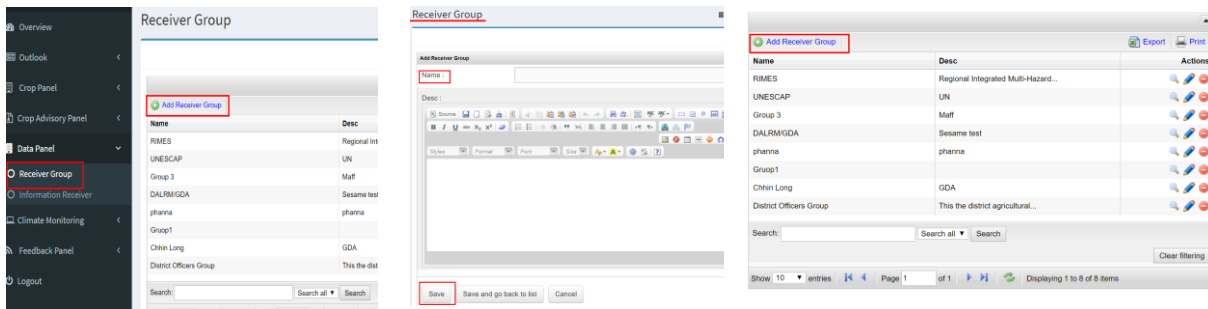
Step 1 – Click **“Receiver Group”** under Data Panel

Step 2 – Click **“Add Receiver Group”** to create the group

Step 3 – Enter the Name of the Group and set a brief group information

Step 4 – Click **“Save”** or **“Save and go back to list”** if you want to save the information or else click **“Cancel”**

Step 5 – User can check the group created in the Receiver Group List and there is option for **“View Receiver Group”**, **“Edit”** and **“Delete”** the group created



Step 1 to 2

Step 3 to 4

Step 5

After creating the receiver group at Receiver Group Panel, user can go to **“Information Receiver Panel”** to enter detailed contact list of members of the group created. The following Steps will guide user to enter Information Receiver Contact Details linked to the group created.

Step 1 – Click **“Information Receiver”** at Data Panel

Step 2 – Select **“Add Receiver”** to enter detailed information of group members

Step 3 – Enter Contact Information of Information Receiver and make sure to select the group name the member belongs to.

Step 4 – Click **“Save”** or **“Save and go back to list”** if you want to save, otherwise click **“Cancel”**

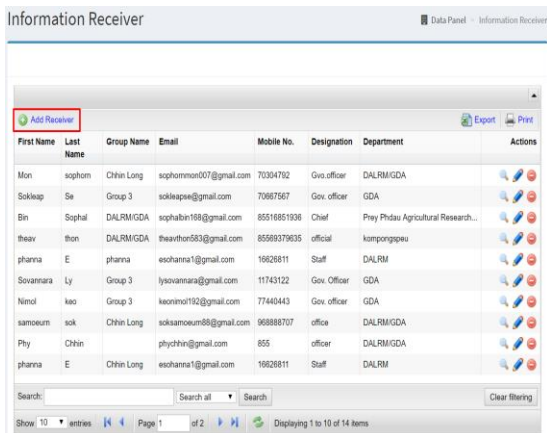


Figure 6.1 Information Receiver

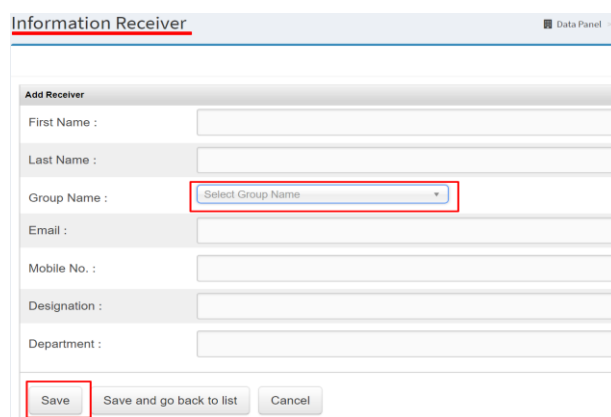
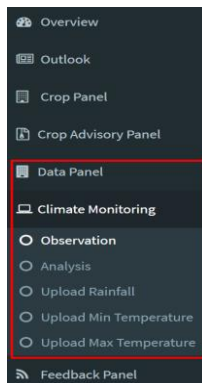


Figure 6.2 Adding Detailed Information of the Receiver

7. Climate Monitoring Panel



This session intends expert admin user to check validation of forecast vs observed condition as well as allows the user to upload observed weather parameters (rainfall, minimum temperature and maximum temperature). The session is divided into five sub-panel; Observation, Analysis, Upload Rainfall, Upload Minimum Temperature and Upload Maximum Temperature. SESAME for Cambodia is at initial stage, there is no observation data for provinces as of now and it will be uploaded later by representative focal from Department of Meteorology (DOM) and Department of Agricultural Land Resource Management (DALRM). The below session will guide user to upload observation data, check and analyse the condition.

7.1 Observation and Analysis

Suppose, if observation data for last 10 years has been entered to the system, user can check observation data of provinces/district for specific parameter by doing the following steps;

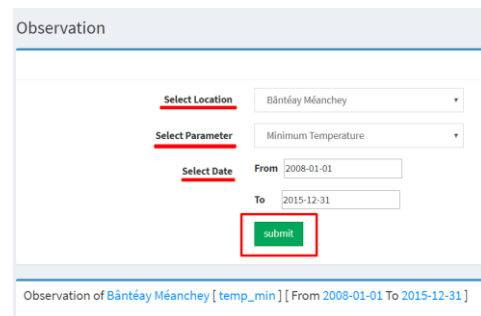
Step 1 – Click **“Observation”** panel under **“Climate Monitoring”**

Step 2 – Select the location (Province/District)

Step 3 – Select the weather parameter

Step 4 – Set date of observation data

Step 5 – Click **“Submit”**. Then, user can see the Observation Data for the district/province of selected period with graphs.



User can check forecast by WRF vs observed data by doing following steps;

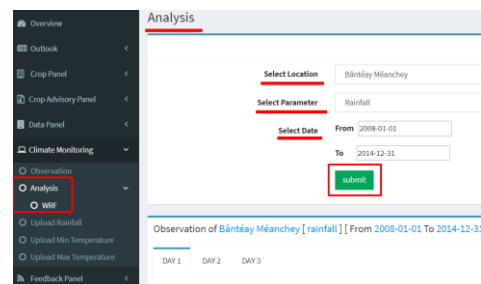
Step 1 – Click **“Analysis”** panel and then to **“WRF”** under Climate Monitoring Panel

Step 2 – Select the location (Province/District)

Step 3 – Select the weather parameter i.e rainfall

Step 4 – Set date of observation data

Step 5 – Click **“Submit”**. Then, user can see the WRF Forecast vs Observed Data for the district/province of selected period with graphs.



7.2 Upload Rainfall, Minimum Temperature and Maximum Temperature

This session allows expert user to upload rainfall, temperature (minimum and maximum) observed data for the districts/provinces and guides to follow the format set by the system. In order to upload observed data, users are guided to follow;

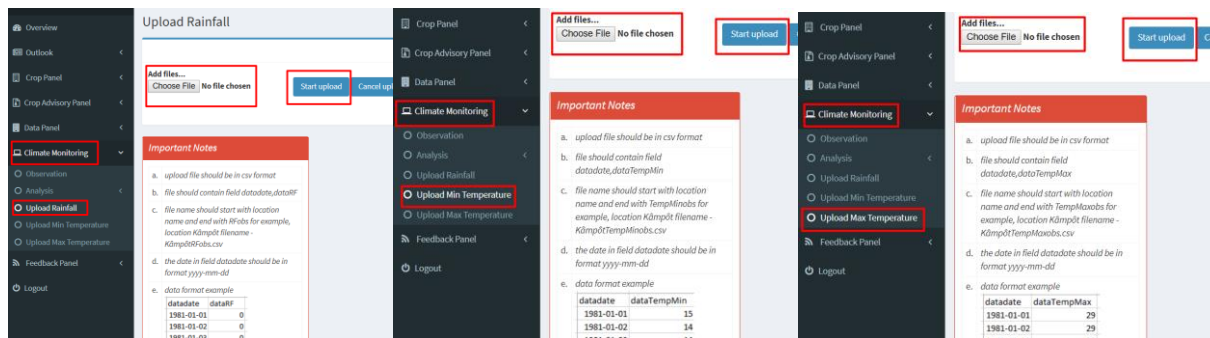
Step 1 – Click **“Upload Rainfall”, “Upload Minimum Temperature”** and **“Upload Maximum Temperature”** to upload rainfall, minimum and maximum temperature respectively

Step 2 – Prepare observed data file and save it (Important Notes for preparing observed data file is detailed out herewith)

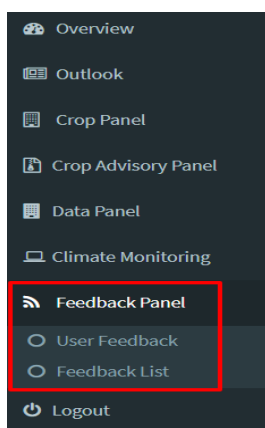
- a) Upload file should be in csv format
- b) File should contain Field datadate, dataRF/dataTempMin/dataTempMax (RF – Rainfall, TempMin – Temperature Minimum and TempMax – Temperature Maximum)
- c) File name should start with location name and end with RFObs/TempMinObs/TempMaxObs (eg. Rainfall Data for location Kampot – File Name [KampotRFObs.csv](#))
- d) Date in field database should be in yyyy-mm-dd

Step 3 – Choose the file located in your computer system

Step 4 – Click **“Start Upload”** to upload the file or else **“Cancel Upload”** if you want to cancel



8. Feedback Panel



This session is divided into two; User Feedback and Feedback List, where admin user can provide feedback and track the feedback provided by users respectively.

If admin user wants to provide feedback to system administrator, user can go to **“User Feedback”** and enter the feedback in the comment box. Please note that user name will be displayed as your given name at User Access.

If admin user wants to check the feedback, user can click **“Feedback List”** under Feedback Panel.

9. Pest and Disease Information Panel

SESAME system is enhanced further with inclusion of a pest management component. In the section expert users can enter any number of pest and related information corresponding to a particular crop and growth stages. Once the information is added, the system is designed to automatically use the pest information in the advisory generation. The system allows to enter both in Khmer and English language.

Experts can enter all information relevant to pest and the attack including the pest type and its characteristics and the weather influence. System allows to enter temperature, humidity ranges favorable for pest attacks. The system also allows to define threshold-based alerts for these parameters.

- 🏠 ទិដ្ឋភាពទូទៅ
- 📄 ការប្រមើល
- 📅 ផ្ទាំងដំណាំ
- ★ ផ្ទាំងកត្តាចង្រៃ
 - បញ្ជីកត្តាចង្រៃ
 - បន្ថែមព័ត៌មានកត្តាចង្រៃ
- 📄 ក្រុមប្រឹក្សាខាងដំណាំ
- 📄 ទិន្នន័យជាក្រុម
- 📄 ការត្រួតពិនិត្យអាគាសធាតុ
- 📄 ក្រុមវាយតម្លៃ
- 📄 ចាកចេញ

បន្ថែមព័ត៌មានកត្តាចង្រៃ

ប្រើសរសៃខេត្ត

ប្រើសរសៃដំណាំ

ការលូតលាស់ដំណាំ

ឈ្មោះកត្តាចង្រៃ

ប្រភេទកត្តាចង្រៃ

កម្រិតចម្លាញរបស់កត្តាចង្រៃ

ការគ្រប់គ្រងកត្តាចង្រៃ

លក្ខខណ្ឌសីតុណ្ហភាពសមស្របរបស់កត្តាចង្រៃ (°C)

សីតុណ្ហភាពអតិប្បបរមា

សីតុណ្ហភាពអប្បបរមា

សីតុណ្ហភាពសមស្របចំផុត

លក្ខខណ្ឌសំណើមសមស្របរបស់កត្តាចង្រៃ (%)

សំណើមអតិប្បបរមា

សំណើមអប្បបរមា

សំណើមសមស្របចំផុត

រក្សាទុក

បញ្ជីកត្តាចង្រៃ

ប្រើសរសៃខេត្ត

ប្រើសរសៃដំណាំ

submit

ទីតាំងដំណាំ	ដំណាំ	ឈ្មោះដំណាំ/ការលូតលាស់របស់ដំណាំ	ឈ្មោះកត្តាចង្រៃ	ប្រភេទកត្តាចង្រៃ	កម្រិតចម្លាញរបស់កត្តាចង្រៃ	សីតុណ្ហភាពអតិប្បបរមា(°C)	សីតុណ្ហភាពអប្បបរមា(°C)	សីតុណ្ហភាពសមស្របចំផុត(°C)	សំណើមអតិប្បបរមា(%)	សីតុណ្ហភាពអប្បបរមា(%)	សីតុណ្ហភាពសមស្របចំផុត(%)	លុប	
កំពង់ស្ពឺ	ស្រូវ/កណ្តាល-ផ្កាថ្មី	វេទលូតលាស់		មមាចព្រោត	សត្វល្អិត	២៥	42.00	33.00	37.00	70.00	60.00	65.00	លុប

As the database is relational in nature all pest information shall be automatically used in the crop advisory section with advisories on potential pest attacks.

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ANNEXS

Annex 1. Sample Special Agro-Climatic Bulletin



Department of Agriculture and Land Resources, Cambodia

Special Agro-Climatic Bulletin

Weather Outlook and Advisory

Forecast for Pentad [11-15 Jul]

Location Name	BÂNTÉAY MÉANCHEY
Accumulated Rainfall	Expected accumulated rainfall for pentad 11-15 Jul 2018 is 41.03 mm. The spell is expected to be mostly Wet
Temperature Forecast	Expected variation in this pentad 11-15 Jul 2018 is likely to from maximum temperature of 28.78 deg.C to minimum temperature 25.20 deg.C

Agroclimatic Variables for the pentad 11-15 Jul

Accumulated Rainfall	Soil Moisture	PET	Spell Type	Rainy Days	Humidity
41.03 mm		18.69		5	86.45%
Above Normal	deficit		Wet	Days	

Forecast for Pentad [16-20 Jul]

Accumulated Rainfall	Expected accumulated rainfall for pentad 16-20 Jul 2018 is 57.02 mm. The spell is expected to be mostly Wet
Temperature Forecast	Expected variation in this pentad 16-20 Jul 2018 is likely to from maximum temperature of 29.68 deg.C to minimum temperature 25.05 deg.C

Agroclimatic Variables for the pentad 16-20 Jul

Accumulated Rainfall	Soil Moisture	PET	Spell Type	Rainy Days	Humidity
57.02 mm		18.34		5	87.32%
Above Normal	deficit		Wet	Days	

Month outlook of August

FORECAST NOT AVAILABLE OR NORMAL DATA NOT AVAILABLE.

Seasonal Outlook of Aug|Sep|Oct

FORECAST NOT AVAILABLE OR NORMAL DATA NOT AVAILABLE.

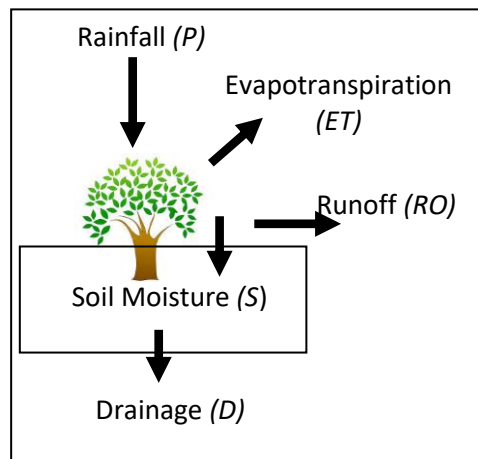
Previous Month outlook of July

Previous Seasonal Outlook of Jul|Aug|Sep

Annex 2. ESTIMATING PET

Take for example the following simplified soil-water balance equation, based on Thorntwaite and Mather (Thorntwaite et al, 1955;1957).

Eq 1 $P = ET + RO + dS + D$; where dS is the change in soil moisture over the time step.



Of these, rainfall and runoff (as stream flow) are directly measured. However, to satisfy the water balance, either drainage (or groundwater recharge) or Evapotranspiration (ET) also need to be estimated/measured. Both of these are non-trivial. ET is one of the most challenging of water balance components to estimate, or directly measure.

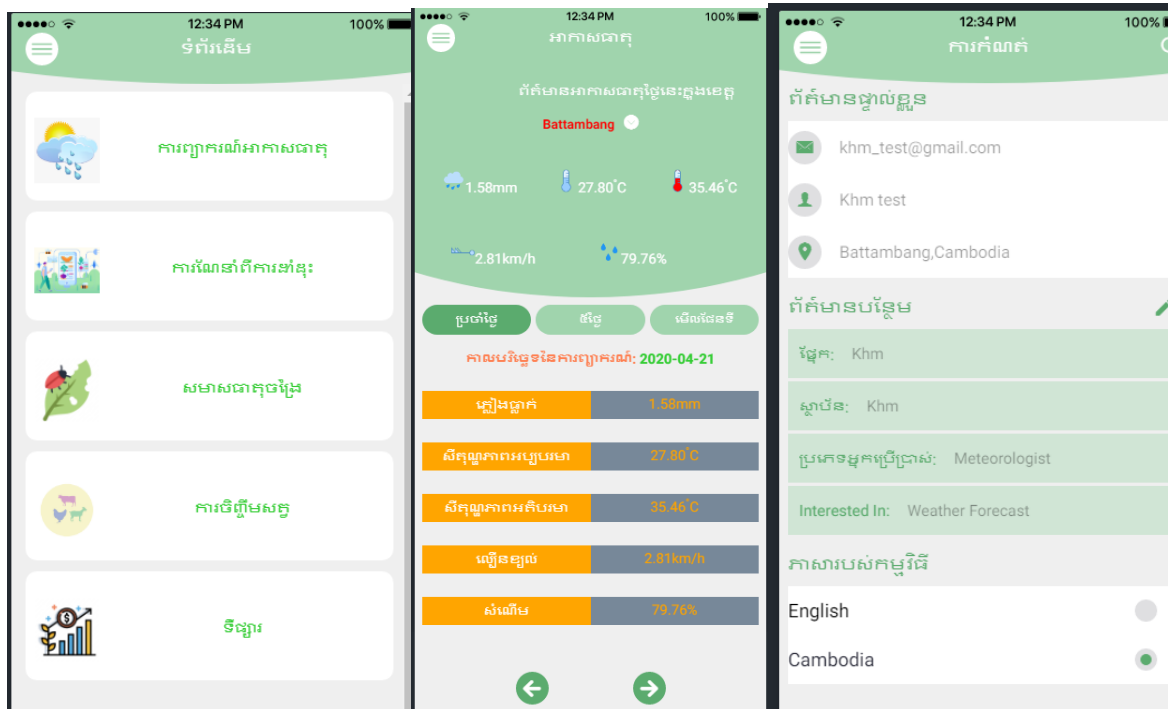
The aim of this document is to provide a condensed set of equations/procedures to estimate two measures of Evapotranspiration (ET) from weather data.

(a) Potential evapotranspiration (PET) - using the Priestley-Taylor method. This can be used in non-agricultural and forested areas to derive actual evapotranspiration and in water balance calculations (Priestley et al., 1972); and (b) the reference crop ET (ET_o), using the Hargreaves method (Hargreaves et al.; 2003), which can then be used for estimating ET from cultivated areas.

Reference:

<http://www.fao.org/docrep/X0490E/x0490e00.htm>, and from which much of this material is drawn.

Mobile App Dashboard



The app provides dual language support and provides option or farmer to directly call the resource center for any query. Farmers can also customize app to “My Crop” to get customized advisories and alerts during the different growth stages.



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