



User Guide



This User Guide was developed by the project “Upscaling of WeRise in wider rainfed rice areas of Southeast Asia and Sub Sahara Africa through database development and capacity building,” with funding support from the Japan International Research Center for Agricultural Sciences.

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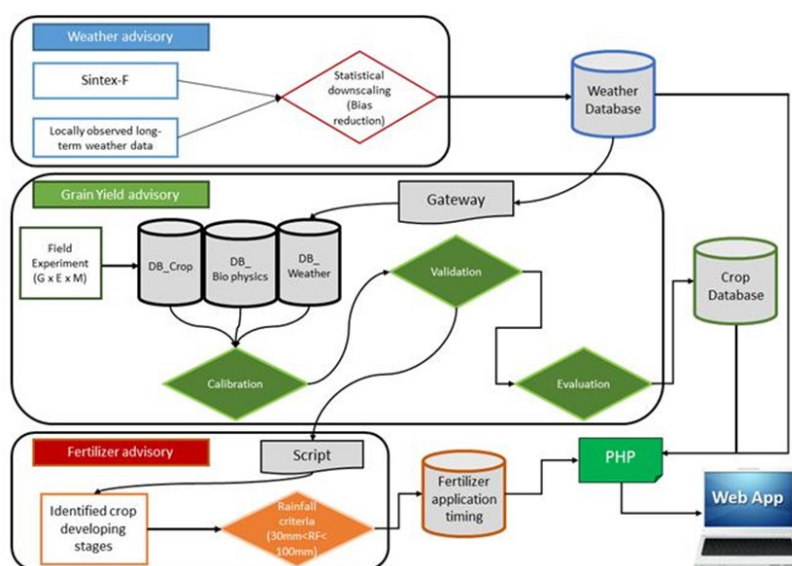
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1.0 Overview of WeRise

With the conversion of irrigated agricultural lands to non-farm uses, enhancing rice production in rainfed ecosystems has become an important strategy to achieve food security in countries where rice is a staple. Rainfed rice areas are characterized by high poverty incidence and low yield which could be attributed to an inherently risky production as it relies on rainwater availability. Climate change further compounds agricultural risk as it brings about climate variability which results in uncertainties in the amount and distribution of rainfall and rising temperatures, among others. This makes it difficult for farmers to determine when to plant their crops and consequently plan subsequent production activities (Hayashi, 2016) using their past experiences/local knowledge.

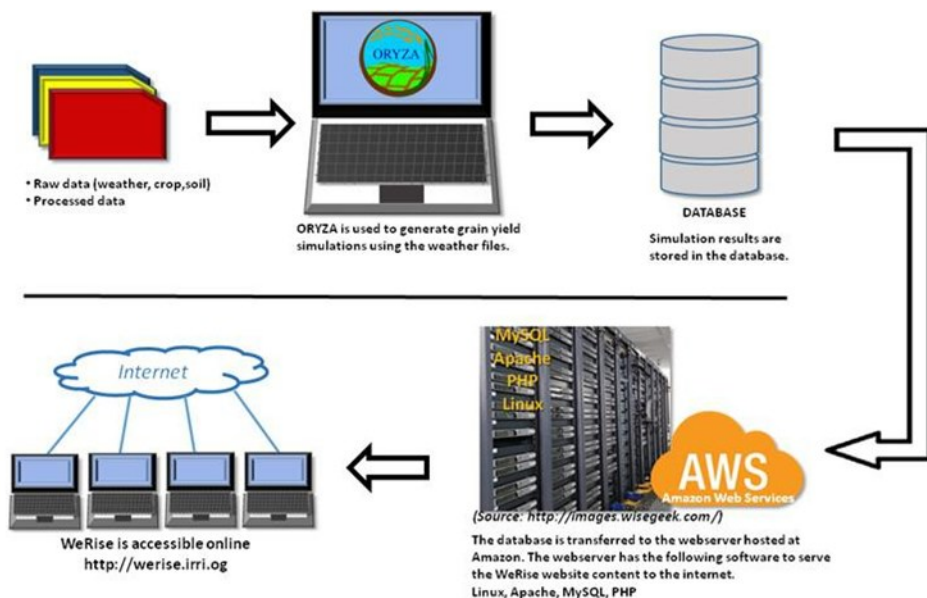
The Weather-rice-nutrient integrated decision support system (WeRise) is an ICT tool developed to improve the livelihood of rainfed rice farmers under current and future climate scenarios. It integrates a localized seasonal climate prediction and real-time weather data with a crop growth model. It is web-based and could provide advisories on the onset of rainfall, distribution of rain throughout a cropping season including the occurrence of drought and flooding, optimum timings for sowing and fertilizer application, and the suitable variety for planting. Advisories could be generated three months before the cropping season and could thus potentially give farmers enough time to plan/allocate their resource use and crop production schedule more efficiently.

WeRise is a decision support system that integrates localized seasonal climate prediction and real-time weather data with a crop growth model. The seasonal weather predictions are based on the statistical downscaling of SINTEX-F ocean-atmosphere coupled general circulation model (GCM) developed by Japan's Agency for Marine-Earth Science and Technology (JAMSTEC). Yield predictions are based on recommended sowing and fertilizer application timings using the ORYZA crop growth model, which simulates the growth and development of rice as well as water under different conditions (Figures 1-1 and 1-2).



Source: Hayashi and Llorca, 2016.

Figure 1-1. Conceptual structure, models' integration and users' interface of WeRise.



Source: Hayashi and Llorca, 2016.

Figure 1-2. Function of the components for the development of web-application.

Compilation of experimental and observed data in a form of database is a crucial step in the development of WeRise. The system requires data related to weather, crop, soil, and management practices. Statistical downscaling, calibration, and validation are done to improve the accuracy of the predictions.

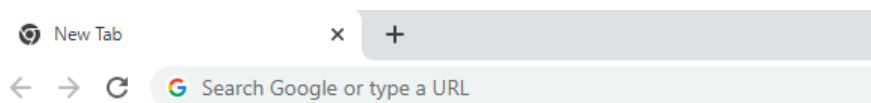
Through WeRise, extension workers may be able to provide advisories to help farmers plan their crop production more strategically through better and informed decisions. Researchers, development managers, and policy makers can also use WeRise in developing evidence-based R&D plans and policies. Farmers can also use WeRise directly.

WeRise was developed by the IRRI-Japan Collaborative Research Project with funding from Japan's Ministry of Agriculture, Forestry and Fisheries and Japan International Research Center for Agricultural Sciences. WeRise upscaling in selected Sub-Saharan African countries are ongoing.

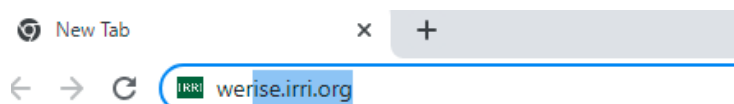
2.0 Getting started

2.1 Log in

Open a web browser (e.g., Google Chrome, Firefox, Internet explorer, Microsoft Edge, others).



Type the website address/URL of WeRise: werise.irri.org and press “Enter” on your keyboard. You will be directed to the WeRise homepage (Figure 2-1).



2.2 Navigate WeRise

The WeRise Home page consists of the menu bar, tools and icons.

Table 2-1. Description of menu options and tools in the WeRise Home page.

Menu/Tools	Description
WeRise	Default landing page /Home
About WeRise	Provides a brief description of WeRise, partner institutions in WeRise development, and contact details for additional information
Weather Advisory	Enables the user to generate weather advisories, may also be accessed by clicking the image at the bottom of the Home page
Crop Advisory	Enables the user to generate crop advisories, may also be accessed by clicking the image at the bottom of the Home page
Terms and Conditions	Describes terms and conditions related to Intellectual Property (IP)
English	Language menu with English set as the default language. Click the dropdown menu to change the language
Print	Allows the user to print the WeRise advisories
User name	The icon for this will appear beside the “Print” function once the user has logged in.

IRRI

WeRise About WeRise WEATHER ADVISORY CROP ADVISORY TERMS AND CONDITIONS

Menu bar

English Print

Tools

WeRise
Decision Support System for Rainfed Rice Production

WeRise (Weather-rice-nutrient integrated decision support system)

Rainfed rice yields are low and unstable mainly because of uncertainty in rainfall amount and distribution, existence of nutrient stress, and pest occurrence. Climate change poses the grave threat of extreme weather events that could further reduce rice productivity in rainfed areas.

The IRRI-japan project on Climate Change Adaptation in Rainfed Rice Areas (CCARA) is developing a decision support system (WeRise) to improve the livelihood of rainfed rice farmers under current and future climate scenarios. This system uses a seasonal-weather forecast that provides farmers crucial weather information such as the start and end of the rainy season and rainfall distribution during the crop growing season. It also advises farmers when to sow and transplant the crop, what variety is appropriate, and how fertilizer may be efficiently applied.

Field tests on the WeRise prototype are going on in Indonesia and Lao PDR. The prototype for other countries may also be explored. To run the prototype, please click on the weather advisory or crop advisory image below or button above. Feedbacks to improve the prototype and/or establish collaboration are welcome.

Predicted JJA2015 SST anom. from 1apr2015 (9-member)

Weather Advisory

Crop Advisory

Icons

IRRI-japan Collaborative Research Project

The IRRI-japan Collaborative Research Projects have been funded by the government of Japan through the Ministry of Agriculture, Forestry, and Fisheries (MAFF) since 1984. CCARA, which is the latest project, was launched in August 2010 and will end in September 2015.

Figure 2-1. WeRise Home page.

3.0 How to login and register a WeRise account

3.1 Click “Weather Advisory” or “Crop Advisory” from the menu bar or their corresponding icons at the bottom of the page (see page 6). You will be directed to the log in screen. Enter your user name and password. **NOTE:** If you are a first-time user, create your own username and password by registering a FREE WeRise account. To do this, click the “Register an account now!” button after the “Login” button.

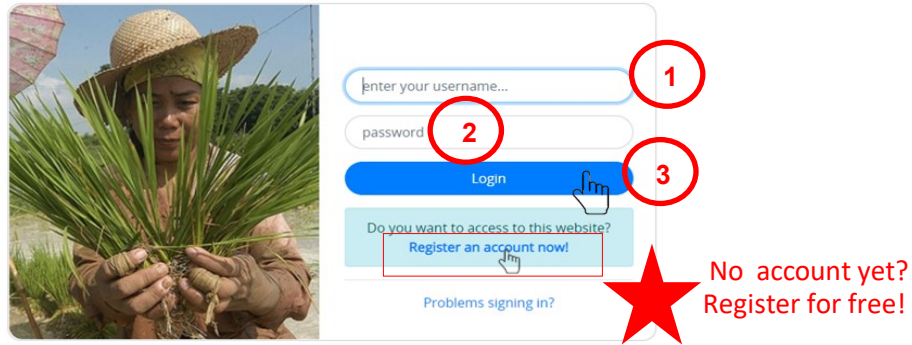


Figure 3-1. WeRise log in screen.

3.2 Fill out the Account Registration form (Figure x). Then, click “Submit.” **IMPORTANT:** Remember your username and password. You will need them every time you log in (See Figure 3-1 above).

A screenshot of the 'Account Registration' form on the IRRI website. The form includes fields for Username, Password, Re-type Password, Full Name, Email Address, Contact Address, and Phone. At the bottom, there is a text area for 'Share with us the reason why you want to use WeRise' and a green 'Submit' button with a checkmark icon.

Figure 3-2. WeRise account registration form.

3.3 If registration is successful, you will receive the note below.



Figure 3-3. Notification regarding a successful WeRise account registration.

4.0 How to generate weather advisories

4.1 Login (see 3.1 on page 7). Click the “Weather advisory” found on the menu bar or its corresponding icon found at the bottom of the Home page (see page 6).

4.2 Select the location > year > Weather data. Then, click “Show Advisory.”

IMPORTANT: Scroll down the page to see the full advisories.

The screenshot shows the 'Weather Advisory' form on the WeRise website. The form is titled 'Dataset' and includes the following fields and options:

- Location:** A dropdown menu showing 'Senegal' (marked with a red circle 1) and a text input field containing 'Saint-Louis Department' (marked with a red circle 2).
- Year:** A dropdown menu showing 'Forecast' and '2021' (marked with a red circle 3).
- Weather data:** A section with several checkboxes: 'Rainfall' (unchecked), 'Temperature' (checked), 'Solar Radiation' (unchecked), 'Early morning vapor pressure' (unchecked), and 'Wind Speed' (unchecked). This section is marked with a red circle 4.
- Show Advisory:** A green button with a white arrow icon, located at the bottom of the form.

Figure 4-1. Steps in generating weather advisories.

5.0 How to print and save the WeRise advisories

5.1 Click the “Print” icon beside your username.

IRRI / WeRise / Weather Advisory



Weather Advisory

Thanks to our partners who provided the weather data displayed here. In the form below, choose the weather dataset you wish to see.

Dataset

Location

Figure 5-1. Step 1: How to print the weather advisories.

5.2 Select Printer settings (destination, number copies, etc.) and click “Print”.

Print 2 sheets of paper

Destination

Pages

Copies

Color

More settings

2

Figure 5-2. Step 2: How to print the weather advisories.

5.3 You may also choose to save the file for printing later. To do this, change the “Destination” to “Save as PDF” in the Printer settings. Then, click “Save.”

The screenshot shows a web application interface for weather advisories. The main content area displays a 'Weather Advisory' form with fields for 'Location' (Senegal), 'Year' (2021), and 'Weather data' (Temperature, Solar Radiation, Early morning vapor pressure, Wind Speed). Below the form is a 'Forecast Weather Data' chart showing rainfall (mm) over time (Jan 2021 - Dec 2021) with a 'Wet Season' highlighted. The print dialog is open on the right side, showing 'Print' settings for '2 pages'. The 'Destination' dropdown menu is set to 'Save as PDF', and the 'Save' button is highlighted with a red circle and the number '2'.

Figure 5-3. Steps in saving the weather advisories.

NOV21, 10:16 AM WFO - Tools and Database - WeRise - Weather risk-oriented integrated decision support system

[WRI](#) / [WeRise](#) / Weather Advisory English

Weather Advisory

Thanks to our partners who provided the weather data displayed here. In the form below, choose the weather dataset you wish to see.

Dataset

Location

Year

Weather data

Rainfall
 Temperature
 Solar Radiation
 Early morning vapor pressure
 Wind Speed

Advisory

Data is displayed in 10-day period values. Statistical [mean](#) and [percentile](#) is computed using historical data. We get the 20th percentile (P20) to determine periods with extremely low values and the 80th percentile (P80) to determine periods with extremely high values of the population.

Rainfall

Forecast Weather Data

Location: Saint-Louis Department, Saint-Louis Region

Jan 2021 - Dec 2021

Rainfall
 P20
 Mean
 P80

Temperature

wrisetool.org/index.php?option=com_weather 12

Figure 5-4a. Sample output of WeRise: weather advisories.



Figure 5-4b. Sample output of WeRise: weather advisories continued.

6.0 How to generate crop advisories

6.1 If you are not yet logged in, login by following instructions on 3.1 (page 7). Click the “Crop advisory” found on the menu bar or its corresponding icon found at the bottom of Home page (see page 6).

6.2 Select the location > year > number of crops (i.e., single crop or two-crop combination)

IRRI WeRise About WeRise WEATHER ADVISORY CROP ADVISORY Terms And Conditions

IRRI / WeRise / Crop Advisory English Print SAMPLE NAME

Crop Advisory

ORYZA version 3 was used to simulate grain yield scenarios. This allows us to predict the optimum crop schedule based on forecasted weather data. From these choices of possible scenarios, you can select the specific crop schedule that suits you best. In addition to that, we will guide you on several aspects to plan your cropping schedule.

Dataset

Location: Senegal Saint-Louis Department, Saint-Louis Region

Year: Forecast 2021

Single Crop Two Crop Combination

Figure 6-1a. Steps in generating crop advisories.

6.3 Select the variety (if you have chosen single crop)/varieties (if you have chosen two-crop combination) and click “Show Advisory.”

Rice Variety Combination

First crop Variety: IR64

Second crop Variety: IR64

Info on IR64:

- Maturity: 116 - 125 days (long maturity)
- Yield Average: 5.00 t/ha
- Yield Potential: 9.20 t/ha

More Options

Show Advisory

Figure 6-1b. Steps in generating crop advisories continued.

6.4 If you want to set the sowing date/s, instead of clicking “Show advisory,” click “More Options” after choosing the variety/varieties.

Rice Variety Combination **5**

First crop Variety: IR64

Info on IR64:

- Maturity: 116 - 125 days (long maturity)
- Yield Average: 5.00 t/ha
- Yield Potential: 9.20 t/ha

Second crop Variety: IR64

Info on IR64:

- Maturity: 116 - 125 days (long maturity)
- Yield Average: 5.00 t/ha
- Yield Potential: 9.20 t/ha

6 ... More Options

Show Advisory

Figure 6-2a. Steps in generating crop advisories if you have a preferred sowing date.

6.5 Set your preferred sowing date/s. Select the Fertilizer Application.

Note: WeRise follows the blanket fertilizer recommendations in the location. Then, click “Show advisory.”

7

First crop Sowing date: 05/20/2021

Second crop Sowing date: 12/20/2021

Fertilizer Application

No Fertilizer

Recommended Fertilizer **8**

Show Advisory **9**

Figure 6-2b. Steps in generating crop advisories if you have a preferred sowing date continued.

6.6 To compute for potential surplus (computed after deducting the amount of rice for household consumption), under the Farmer's Information, enter your farm size (the default is 1 ha) and number of family members per age bracket (the default is 2 per age bracket).

Farmer's Information

Please supply the information so we can compute the total grain yield with respect to the actual farm scenario.

Farm size
1 ha.

Number of family members
0-14 yrs. old 2 15+ yrs. old 2

Figure 6-3. Information requirements to determine any potential surplus.

The following table in the Crop Advisory will change.

The total rice production of the entire cropping season is calculated with respect to the specific farmer's information supplied above.

	First crop (t)	Second crop (t)	TOTAL (t)
Actual production (1 ha)	6.71	8.01	14.72
Family consumption ¹	0.13	0.13	0.26
Surplus	6.58	7.88	14.46

¹ Rice consumption of one adult person for 6-month period is 42.5 kilograms. (Source: <http://ricestat.irri.org:8080/wrsv3/>)

Figure 6.4. Crop advisory outputs for any potential surplus after supplying the required information indicated in Figure 6-3.

6.7 If available, compute for supplemental irrigation requirements by supplying the following information.

Supplementary Irrigation

This is advisory for supplemental irrigation and calculate costs.

Please supply the information so we can compute the irrigation requirements.

Water pump discharge rate
20 liters / second

Fuel consumption rate
1 liters / hour

Fuel Price
775.00

Figure 6-5. Information requirements to compute for supplemental irrigation.

The details of the following table in the Crop Advisory will change.

Guidelines		
Schedule	Drought period (5-6 day interval)	Drought period (5-6 day interval)
Amount of time needed to irrigate deficit	$(54 \text{ hours/ha}) \times (1 \text{ ha}) = 54 \text{ hours}$	$(133 \text{ hours/ha}) \times (1 \text{ ha}) = 133 \text{ hours}$
Fuel consumption	54 liters	133 liters
Fuel cost	41,850	103,075

Figure 6-6. Crop advisory output for supplemental irrigation after supplying the required information indicated in Figure 6-5.

6.8 To print or save your crop advisories, please follow the instructions on pages 9-10.

Crop Advisory

[ORYZA version 3](#) was used to simulate grain yield scenarios. This allows us to predict the optimum crop schedule based on forecasted weather data. From these choices of possible scenarios, you can select the specific crop schedule that suits you best. In addition to that, we will guide you on several aspects to plan your cropping schedule.

Optimum sowing dates for two cropping seasons

Below is the list of best schedules based on simulated grain yield values from ORYZA2000. The colored rows are the currently chosen schedule. You can choose an alternate schedule by clicking on the "Choose" button at the right side.

Location: Saint-Louis Department, Saint-Louis Region, Senegal

Year: 2021 Forecast

<input type="checkbox"/> First crop Sowing / Harvest	<input type="checkbox"/> Second crop Sowing / Harvest	Variety	Rainfall (mm)	Yield (t/ha)	Yield Total (t/ha)
MAY-25 SEP-26		IR64	329.9 above normal	6.71	
	DEC-28 MAY-14	IR64	0.0 normal	8.01	14.72 <input type="button" value="★ Choose"/>
	NOV-15 MAR-25	IR64	0.0 normal	7.74	14.45 <input type="button" value="★ Choose"/>
JUN-08 OCT-07		IR64	346.5 above normal	6.67	
	DEC-28 MAY-14	IR64	0.0 normal	8.01	14.68 <input type="button" value="★ Choose"/>
	NOV-15 MAR-25	IR64	0.0 normal	7.74	14.41 <input type="button" value="★ Choose"/>

Rainfall Category:

- **normal:** Rainfall amount is similar to previous years
- **above normal:** Rainfall amount is greater than previous years
- **below normal:** Rainfall amount is less than previous years

Advisory

You have chosen as the sowing date for the first crop and for the second crop. The following sections will guide you to maximize cropping inputs such as fertilizer application and irrigation requirements.

Calendar

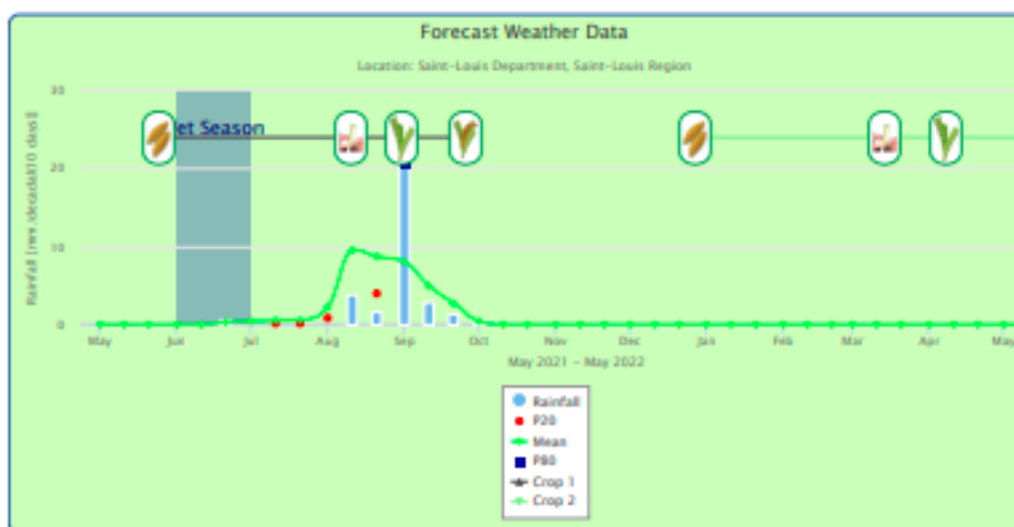
This is the schedule of the entire cropping calendar from sowing to harvest including the fertilizer application to attain the expected grain yield.

Figure 6-7a. Sample output of WeRise: crop advisories for two-crops.

8/28/21, 11:08 AM

WRI - Tools and Database - WeRise - Weather risk-rubric integrated decision support system

Sowing Date	Panicle Init.	Flowering	Harvest Date	Fertilizer Schedule		
				Basal	Top Dress 1	Top Dress 2
First crop - Variety: IR64 - Yield: 6.71 t/ha						
2021-MAY-25	2021-AUG-10	2021-AUG-31	2021-SEP-26			
Second crop - Variety: IR64 - Yield: 8.01 t/ha						
2021-DEC-28	2022-MAR-14	2022-APR-08	2022-MAY-14			



The red circle signifies dates where expected rainfall is less than what was observed in previous years. The blue square signifies dates where expected rainfall is greater than what was observed in previous years.

Farmer's Information

Please supply the information so we can compute the total grain yield with respect to the actual farm scenario.

Farm size

Number of family members

Supplementary Irrigation

This is advisory for supplemental irrigation and calculate costs.

Please supply the information so we can compute the irrigation requirements.

Water pump discharge rate

www.iri.org/index.php?option=com_voyce

2/8

Figure 6-7b. Sample output of WeRise: crop advisories for two-crops continued.



Figure 6-7c. Sample output of WeRise: crop advisories for two-crops continued.

7.0 Where to find more information about WeRise

Training manuals , FAQs, and other publications about WeRise may be downloaded from this site:
<https://www.irri.org/werise>

8.0 Send us your feedback

Share with us your experience by answering the WeRise user experience questionnaire found in the link below:

<https://forms.gle/xmC3YxCbkaKbGhBF7>