WeRise

WEATHER-RICE-NUTRIENT INTEGRATED DECISION SUPPORT SYSTEM

A training manual for agricultural extension workers and other field agents

Towards strategic crop management in rainfed rice areas

IRRI Japan CoLaborative Research Project Since 1984

IRRI

JIRCAS

The International Rice Research Institute (IRRI) aims to abolish poverty and hunger by improving the livelihood and nutrition of people who depend on rice-based agri-food systems. In doing so, IRRI's work protects the health of farmers, consumers, and the environmental sustainability of rice farming in a world challenged by climate change. IRRI also promotes the empowerment of women and supports opportunities for the youth in an equitable agri-food system.

Printed in Cabanatuan, Nueva Ecija, Philippines
First Printing, 2021
ISBN 978-971-22-0323-7 (Print)
ISBN 978-971-22-0324-4 (ePDF)
ISBN 978-971-22-0325-1 (ePub)

Cover image: Keiichi Hayashi
Cover design: Jose T. Gamboa
Layout: Jomar S. Garabiles

International Rice Research Institute
Address: Pili Drive, Los Banos, Laguna, Philippines
Mailing address: DAPO Box 7777, Metro Manila, Philippines
Phone: +63 (2) 8580-5600 | Fax: +63 (2) 8580-5699
Email: info@irri.org
Website: irri.org
Rice Knowledge Bank: knowledgebank.irri.org
Courier address: Suite 1009, Security Bank Center 6776 Ayala Avenue, Makati City, Philippines Tel. +63 (2) 8891-1236, 8891-1174, 8891-1258, 8891-1303

Suggested citation:
Bugayong ID, Orden MEM, Llorca LP, Agbisit RA, Hadiawati L, Hikmah ZM, Chairiyah RR, and Batubara SF. 2021. WeRise: A training manual for agricultural extension workers and other field agents. Los Baños (Philippines): International Rice Research Institute. 59 p.

About the Cover

Sukarni, a female part-time agricultural laborer at the Indonesian Agricultural Environment Research Institute (IAERI) in Pati, Central Java, Indonesia at the time the photo was taken, holds part of the harvest. As with other Asian countries, women play an active role in rice production in Indonesia. They sow seeds, replant, weed and help in harvesting.

WeRise: A training manual for agricultural extension workers and other field agents

Iris D. Bugayong, Maria Excelsis M. Orden, Lizzida P. Llorca, Ruth A. Agbisit, Lia Hadiawati, Zaqiah Mambaul Hikmah, Riri Rizki Chairiyah and Siti Fatimah Batubara

2021

Table of contents

Table of contents

LIST OF TABLES, FIGURES AND APPENDICES

Tables

Figures

LIST OF TABLES, FIGURES AND APPENDICES

Appendices

Message

WeRise is short for "Weather-rice-nutrient integrated decision support system," an information and communications technology (ICT)-based tool. It aims to help rainfed rice farmers decide on the best time to plant and apply fertilizer using the suitable variety in the upcoming cropping season. WeRise if written as "We rise," can turn into a powerful statement. It connotes our capability to respond to challenges, remove constraints, mitigate risks, and endure difficult times. 'To rise' is the summation of the farmers' efforts during and beyond the cropping season.

Thanks to the collaboration with the IRRI-Japan collaborative research project (IJCRP). It enabled Indonesia's National Agricultural Research and Extension System to make valuable contributions to the development of WeRise. The delivery of WeRise to users will require a certain amount of work, as the digitization of farming has become more imperative amidst the pandemic. The extension workers will play a significant role as delivery agents in a digital world. Their everyday job is to help farmers allocate their resources to achieve the optimum yield. To fully reap the benefits of WeRise, the main challenge is to communicate the WeRise advisories effectively to the farmers.

This manual is among the knowledge transfer materials developed by the IJCRP with its partners. As a rice scientist, I find this manual extremely helpful to ensure the smooth translation of science language to field language. As a policymaker, I hope that the knowledge transfer will impact the ultimate beneficiaries, the farmers. I believe this manual will help facilitate the dissemination of WeRise to more rainfed rice areas. I encourage feedback from all stakeholders.

I wish the future training facilitators and participants the best of luck. Finally, I hope that this manual will help build the capacity of extension workers and other field agents to deliver WeRise advisories to rainfed rice farmers effectively.

Priatna Sasmita
Director, Indonesian Center for Food Crops Research and Development
and Acting Director, Indonesian Center for Rice Research

Foreword

WeRise is a technology developed from many years of scientific work. I encourage extension workers to use this technology to increase rice production in the rainfed areas and meet the increasing demand for rice. There are two primary reasons to use WeRise. First, it was developed based on scientific experiments. Second, it is an information and communications technology (ICT)-based tool that can help make agriculture advanced, independent and modern; an aspiration of the Ministry of Agriculture (MoA) of Indonesia to achieve food security. Together, we can further improve this technology, and extension must use it first.

I thank the IRRI-Japan collaborative research project (IJCRP) and the Indonesian Agency for Agricultural Research and Development (IAARD) for making this technology available for Indonesian rainfed rice farmers. Special thanks go to Dr. Keiichi Hayashi who continued to lead this project even after moving back to JIRCAS. I also highly appreciate Ms. Carolyn Florey, IRRI's technology for development lead and IJCRP leader, and the project team members - Prof. Maria Excelsis Orden, IJCRP collaborator from the Philippine Central Luzon State University; Ms. Lizzida Llorca, IRRI researcher and WeRise system developer; and Ms. Iris Bugayong IRRI liaison officer who willingly and patiently shared their expertise. I would also like to extend my sincere gratitude to the centers and institutes under the IAARD, particularly the Indonesian Center for Rice Research and the Assessment Institute for Agricultural Technology of North Sumatra, West Nusa Tenggara, East Java, Central Java, and South Sulawesi, for their contributions in the system development, field validation, and capacity building activities.

I hope that WeRise can help Indonesia achieve its target of increasing rice production by 7%.

Hasil Sembiring
IRRI Representative to Indonesia and Liaison Scientist
IRRI Indonesia

Preface

Rice is one of the essential staples of the human population. It accounts for 32% of the world's caloric intake from three major cereal staples combined; corn, rice, and wheat. Unlike corn and wheat, which are upland crops, rice is an aquatic plant that requires more water to grow and produce grains. Hence, water management is the key to increase its productivity.

Rice is grown in various ecosystems with irrigated area having the most significant contribution in terms of production area and productivity. Irrigated rice accounts for 64% of the harvested area and 75% of the world's rice supply. With the population projected to hit 8.5 billion by 2030, rice demand will also increase. Expanding the area and increasing the productivity of irrigated rice are crucial to meet the increasing demand. Unfortunately, these strategies pose financial challenges for most rice-producing countries.

On the other hand, the rainfed rice area only accounts for 19% of the world's rice supply due to its low productivity (i.e., 2 t/ha or below). It mainly relies on rainfall for crop production and is prone to abiotic stresses like drought. The IRRI-Japan collaborative research projects (IJCRP) on Climate Change Adaptation for Rainfed Rice Areas and Climate Change Adaptation through Development of a Decision-Support tool to guide Rainfed Rice production; were implemented to enhance rainfed rice productivity and ultimately contribute to meeting the increasing rice demand. With funding from the Ministry of Agriculture, Forestry and Fisheries of Japan, these projects developed the Weather-rice-nutrient integrated decision support system (WeRise), a prototype seasonal climate prediction-based decision support system for rainfed rice areas.

Thanks to our collaborators and partners, WeRise was validated. We were also able to confirm its applicability for selected locations and varieties. Continuing WeRise development and validation through collaboration with researchers, agricultural extension workers (AEWs) and local/central governments is imperative before its wider dissemination.

This manual is for AEWs and other field agents who play a crucial role in improving rice production and consequently the livelihoods of rainfed rice farmers. Through this manual, I hope that many AEWs and field agents will enhance their capacity in disseminating extension advisories through WeRise, ultimately overcoming existing constraints to achieve a more stable and sustainable rice production.

Keiichi Hayashi
Collaborative Researcher for IJCRP and
Project Leader, Japan International Research Center for Agricultural Sciences

Acknowledgements

This manual was developed during the implementation of the IRRI-Japan collaborative research project (IJCRP) on Climate Change Adaptation through Development of a Decision-Support tool to guide Rainfed Rice production (CCADS-RR) as part of the partnership agreement between IRRI and the Central Luzon State University (CLSU). With funding support from the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan and the Japan International Research Center for Agricultural Sciences (JIRCAS), this manual greatly benefitted from the participants' feedbacks during the WeRise training for Agricultural Extension Workers (AEWs), which were conducted throughout the project's implementation. The trainings were organized in collaboration with its partners including the Assessment Institute for Agricultural Technology (AIAT) in West Nusa Tenggara and North Sumatra and the Indonesian Center for Rice Research (ICRR).

Dr. Keiichi Hayashi, Collaborative Researcher for IJCRP on CCADS-RR and JIRCAS project leader; Ms. Carolyn Florey, Technology for Development lead of IRRI and IJCRP on CCADS-RR project leader; and Dr. Hasil Sembiring, IRRI-Indonesia Liaison Scientist provided technical guidance throughout the planning and implementation stages of the trainings for AEWs and publication of this manual.

MAFF Japan and JIRCAS showed themselves as flexible funding agencies particularly during the last year of the project's implementation when the pandemic began.

If you will find this manual useful, please know that its creation resulted from the collective effort of its contributors including its writer-editors, project leaders/technical advisers, colleagues/partners from CLSU's Research Office; IRRI's Advocacy and Brand, and Tech Transfer; and the training participants who painstakingly evaluated the manual after the trainings.

Content area

WeRise training manual for agricultural extension workers and other field agents

Introduction

The function of extension or dissemination of an innovation to a wider audience is usually not considered part of a research institution's mandate (Fano et al. 1996). Extension workers help bridge the communication between farmers and researchers particularly during the technology transfer process (Van de Fliert 2000). Participants of the Focus Group Discussions conducted by IJCRP in 2016 noted that among the constraints they encountered in previous technology transfer activities are the insufficient number of technology facilitators and the limited technology information. This could be addressed through the use of the Weather-rice-nutrient integrated decision support system (WeRise), an information and communications technology (ICT)-based tool.

This curriculum is focused on building the capacity of extension workers to deliver extension advisories to rainfed rice farmers through the use of WeRise, an ICT-based decision support tool.

Target audience

This curriculum is designed for extension workers and other field agents who are working directly with rainfed rice farmers.

Curriculum overview

An ICT-based decision support tool could provide advisories to help farmers with their crop production decisions. Over the course of the training, participants will be introduced to WeRise, a decision support tool that could help extension workers deliver extension advisories. They will also be taught to generate and translate WeRise advisories to field language. Lectures, hands-on exercises, guided reflections and discussions will be the primary teaching methods. As a training output, participants will develop a communication plan to deliver the WeRise advisories to farmers. Participants will also be asked to give user feedback on WeRise. Upon completion of the training,

participants will be prepared to apply their skills and knowledge to implement the communication plan they developed and train other extension workers in their respective areas.

Training objectives

By the end of the training, participants will be able to: 1. articulate the data, basic processes, and models used for the development of WeRise; 2. navigate WeRise independently and generate weather and crop advisories under various scenarios; 3. explain the WeRise advisories and translate them to field language that could be easily understood by farmers; and 4. create a site-specific communication plan to facilitate the delivery of WeRise advisories to farmers as a final output of the training.

Training modules

The following gives a brief description of the modules of this training:

1. Technology adoption and decision making (Why?)
   - Will give emphasis on the critical role of extension workers in the technology transfer process by serving as reliable sources of information for farmers, thus, influencing the farmers' decision-making process and technology adoption
   - Will highlight the potential of WeRise as a decision support tool to help extension workers perform their institutions' mandates better (i.e., contribute to food security and economic development goals)

2. Overview of WeRise development (What?)
   - Will provide the context why WeRise was developed and what it can provide
   - Will explain the models, basic data requirements, and processes used to develop WeRise; and
   - Will provide the foundations for the succeeding modules

3. Getting started (How?)
   Will provide the WeRise basics to help users navigate the app – requirements, menus, tools and registering an account.

4. Weather advisories (How?)
   Will demonstrate how to generate weather advisories and interpret and translate them to field language

5. Crop advisories (How?)
   Will demonstrate how to generate crop advisories under different scenarios, and interpret and translate the advisories to field language.

6. Planning for delivery of WeRise advisories (So, what?)
   Will guide the participants to create a site-specific communication plan to deliver the WeRise advisories to farmers.

Schedule

Time allocations may be adjusted as necessary. Nonetheless, two days will be needed to complete the training.

Table 1. Training schedule.

Time allocation (minutes)	Activity	Teaching strategies
Day 1		
	Arrival of training participants	
30	Registration	
90	Installation of WeRise in the participants' laptop computers	
10	Welcome	
20	Overview of the training/Ice breaker	
20	Group photo/Coffee break	
60	Special topic related to extension or technology transfer	Lecture
40	Module 1: Technology adoption and decision-making	Lecture
75	Lunch break	
15	Ice breaker	
60	Module 2: Overview of WeRise development	Lecture Open discussion Post test

Table 1 continued...

Time allocation (minutes)	Activity	Teaching strategies
60	Module 3: Getting started	Lecture Demonstration Hands-on exercises
60	Module 4: Weather advisories	Lecture Demonstration Open discussion Hands-on exercises
30	Synthesis/Assignment/What to expect for Day 2	
	END OF DAY 1 of 2 WeRise Training	
Day 2		
30	Registration	
30	Recap of Day 1/Overview of Day 2	
120	Module 5: Crop advisories	Lecture Demonstration Open discussion Hands-on exercises
90	Module 6: Planning for communicating the WeRise advisories and group presentations	Open discussion Hands-on exercises Presentation
75	Lunch break	
15	Ice breaker	
30	Group reflection	Open discussion
45	User feedback survey/Training feedback survey	
30	Synthesis/So what?/Next steps Awarding of certificates Departure of training participants	
	END OF DAY 2 of 2 WeRise Training	

Module 1: Technology adoption and decision making

Learning objectives

By the end of the module, participants will be able to:

- review the Theory of Innovation Diffusion and the stages of adoption at the individual level
- differentiate the System 1 (intuitive) and System 2 (rational) thinking and their application to the farmers' crop production decisions

Intended outcome

By the end of the module, participants will have gained a better appreciation of their critical role in the technology transfer process particularly in influencing the farmers' decision-making whether to adopt a technology or not, and the need for an ICT-based decision support tool to help them in performing their roles.

Time allocation

40 minutes

Material requirements

Table 2. Module 1: Material requirements.

Resource person	Participants
Laptop computer	Note pad
LCD projector	Ball pen
Powerpoint presentation	

Discussion points/Key messages

- We generally fear the unknown, thus, new technologies could be intimidating. In the technology diffusion model, early adopters are only 13.5% of the population. This model was popularized by Everett Rogers, a professor in communication studies in his book "Diffusion of Innovations" which was first published in 1962. This model seeks to explain how, why, and at what rate new ideas and technology are spread.

Source: https://bit.ly/3bKhoCY

Figure 1-1. Diffusion of innovations.

- The five stages of the adoption process are: knowledge (individual is first exposed to the innovation); persuasion (individual becomes interested in the innovation and seeks related information details); decision (individual decides to adopt or reject the innovation); implementation (trial stage, the individual employs the innovation and also determines its usefulness and may seek further information about it); and confirmation (individual finalizes decision to use the innovation) (Rogers 1995).

- At the individual level, decisions to adopt are affected by the user's needs and attributes. End-users evaluate technologies based on net utility – if large enough, users may adopt/use the technology.

- But, amidst all these concepts, in reality, adoption at the individual is far more complex. Within the farm household, decisions regarding resource use may vary according to age, gender, and bargaining processes within the households (Crambs, 2000). There are also contextual differences including where the technology was developed, the environment of the target community, characteristics of the farmers and their households including goals and livelihood strategies, constraints, project interactions, and group where they belong will result to adoption-adaptation behaviors which should not be labeled as poor adoption or non-adoption outright. In the process of adaptation, farmers are viewed as shopping around for ingredients that they could incorporate in their own farming recipes (Biggs in Crambs, 2000).

- Extension workers play a critical role in whether farmers may choose to adopt or reject a technology. They are cited as a major source of information of farmers, thus, have a large influence in the farmer's decision-making as farmers "shop around for ingredients."

- How do we decide? Consider the following scenarios that farmers may contend with for a particular cropping season:
  - The rains came late and were erratic during the previous cropping season, when is the best time to plant for the next cropping season?
  - Would it still be profitable to plant a second rice crop?

- The scenarios above pose problems which could have more than one alternative solution, hence, entail decisions to make. The rational decision-making process involves the following steps: (1) Define the problem, (2) Identify the criteria, (3) Weigh the criteria, (4) Generate alternatives, (5) Rate each alternative on each criterion, and (6) Compute for optimal decision (Bazerman and Moore, 2013).

- But oftentimes, we make decisions based on rules of thumb – local knowledge/intuitive (e.g., if it rained for 10 consecutive days, I could start plowing. If the crabs/wind are going in a certain direction, then the onset of rain must be near.) We rely on intuition if we don't have sufficient data. However, this is often risky as it could lead to sub-optimal decisions. With the changing environmental landscape, it has been difficult to rely on rules-of-thumb/intuition.

- The good news is: there are ICT-based decision support tools developed using models, data, and an understanding of farm management that could aid the farmers' decision-making process to come up with optimal decisions and consequently reduce risks (CSIRO 2000). WeRise is one of these tools.

References

Bazerman, M. and Moore, D. 2013. Judgment in Managerial Decision Making. 8th ed. John Wiley & Sons.

Cramb, R.A., 2000. Processes influencing the successful adoption of new technologies by small-holders. In W.W. Stür, P.M. Horne, J.B. Hacker and P.C. Kerridge, eds. Working with Farmers: The Key to the Adoption of Forage Technologies. ACIAR Proceedings No. 95, pp. 11–22. Canberra: Australian Centre for International Agricultural Research.

Rogers, E. 1995. Diffusion of Innovations. New York (USA): The Free Press.

Module 2: Overview of WeRise development

Learning objectives

By the end of the module, participants will be able to:
- articulate the data, basic processes, and models used to develop WeRise
- enumerate the advisories that could be provided by WeRise

Intended outcome

By the end of the module, participants will have gained an interest in using WeRise as a tool to facilitate their work.

Time allocation

60 minutes

Material requirements

Table 3. Module 2: Material requirements.

Resource person	Participants
Laptop computer	Note pad
LCD projector	Ball pen
Powerpoint presentation	Copy of the exercises

Discussion points/Key messages

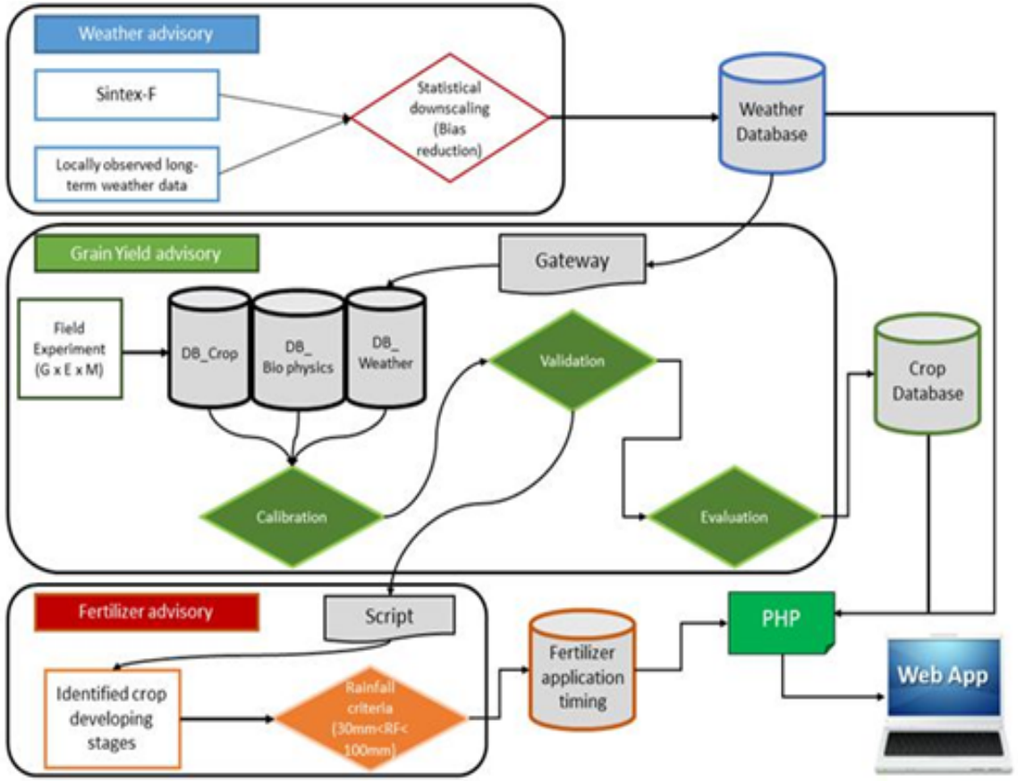
- Needs (High and stable yield). With the conversion of irrigated agricultural lands to non-farm uses, enhancing rice production in rainfed ecosystems has become an important strategy to achieve food security in countries where rice is a staple.

- Constraints (Uncertainties in local weather). 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.

- Solution (Decision support tool). The Weather-rice-nutrient integrated decision support system (WeRise) is an ICT tool developed by the IRRI-Japan Collaborative Research Project (IJCRP) 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 their resource use and crop production schedule more efficiently (Hayashi, 2018).

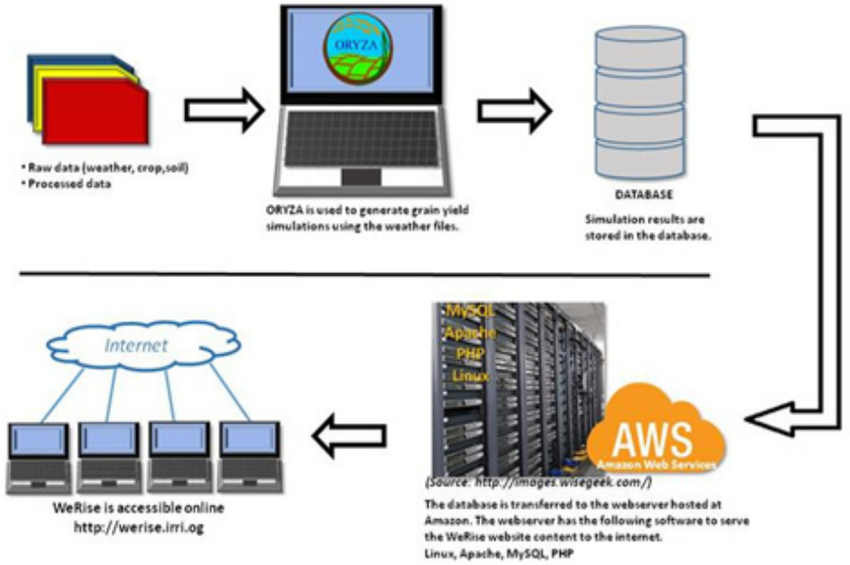
- Models used to develop WeRise. WeRise is a decision support system that integrates localized seasonal climate prediction and real-time weather data with a crop growth model. The seasonal weather predictions are based on the statistical downscaling of SINTEX-F ocean-atmosphere coupled general circulation 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 2-1 and 2-2).

- Data requirements. 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 (Figures 2-1 and 2-2).



Source: Hayashi and Llorca, 2016.

Figure 2-1. Conceptual structure, models' integration and users' interface of WeRise.



Source: Hayashi and Llorca, 2016.

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

- Processes for WeRise development. Statistical downscaling, calibration, and validation are done to improve the accuracy of the predictions (Figure 2-1).

- What's in it for extension workers and farmers. Through WeRise, extension workers may be able to provide advisories to help farmers plan their crop production more strategically through better and informed decisions.

References

Hayashi, K. 2018. Overview of WeRise and the PhilRice-JIRCAS Collaborative Research Project. Powerpoint presentation at the Stakeholders' meeting in Region 3, Philippines.

Hayashi, K. and Llorca, L. 2016. The Weather-Rice-Nutrient Integrated Decision Support System. JIRCAS Working Report No. 83. Tsukuba (Japan): Japan International Research Center for Agricultural Sciences.

Module 3: Getting started

Learning objectives

By the end of the module, participants will be able to:
- register his/her own WeRise account
- familiarize himself/herself with the WeRise home page and its menus and tools.

Intended outcome

By the end of the module, participants will be confident to navigate WeRise.

Time allocation

60 minutes

Material requirements:

Table 4. Module 3: Material requirements.

Resource person	Participants
Laptop computer	Note pad
LCD projector	Ball pen
Powerpoint presentation	Copy of the exercises
	Laptop computer

Discussion points/Key messages

Lesson 1: How to log in to WeRise

Go to: http://werise.irri.org/ or https://www.irri.org/resources-and-tools/digital-tools. You will be directed to the WeRise Home page. The WeRise Home page consists of the menu bar situated after the IRRI logo - at the topmost left-hand corner, and application tools at the right-hand corner.

Table 5. Description of menus and tools in WeRise.

Menu/Tools	Description
WeRise	Default page when you access 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 icon at the lower part of the Home page
Crop Advisory	Enables the user to generate crop advisories, may also be accessed by clicking the icon at the lower part of the Home page
Terms and Conditions	Describes terms and conditions related to Intellectual Property (IP)
English / Bahasa	Language menu. 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 on or registered an account.

Figure 3-1. WeRise home page.

Lesson 2: How to register a WeRise account

1. Click the Weather advisory or Crop advisory tab from the menu bar or the corresponding icons at the lower part of the home page

Figure 3-2. Step 1: How to register a WeRise account.

You will be directed to a log in screen that asks for your username and password. If you do not have an account yet, register a FREE account.

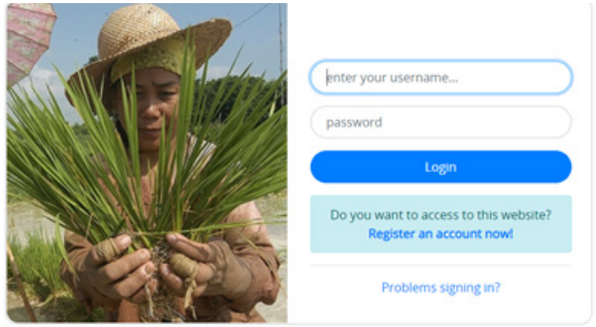


Figure 3-3. WeRise log in screen.

2. Register an account by entering a username, password, retype password, your full name, email address, contact address, phone (mobile number or landline), and why you want to use WeRise. Then, click "Submit."

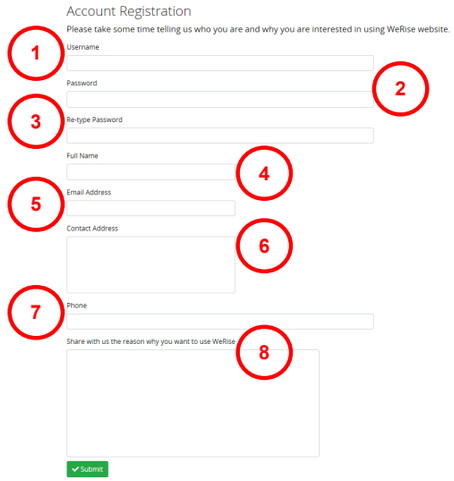


Figure 3-4. Step 2: How to register a WeRise account.

3. If registration is successful (you have entered the required information), you will see the message below.

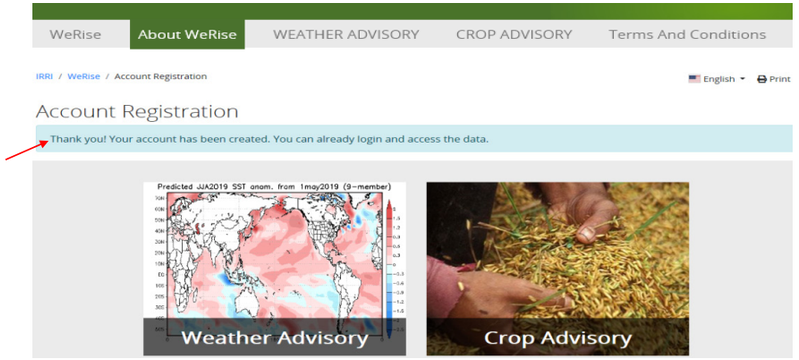


Figure 3-5. Notification regarding a successful WeRise account registration.

When you click the Weather Advisory and Crop Advisory tabs from the menu or their corresponding icon located at the lower part of the Home page, you will be able to access the Weather and Crop advisory pages. Your username will also appear in the upper right portion of the page.

Figure 3-6. How to verify a successful WeRise account registration.

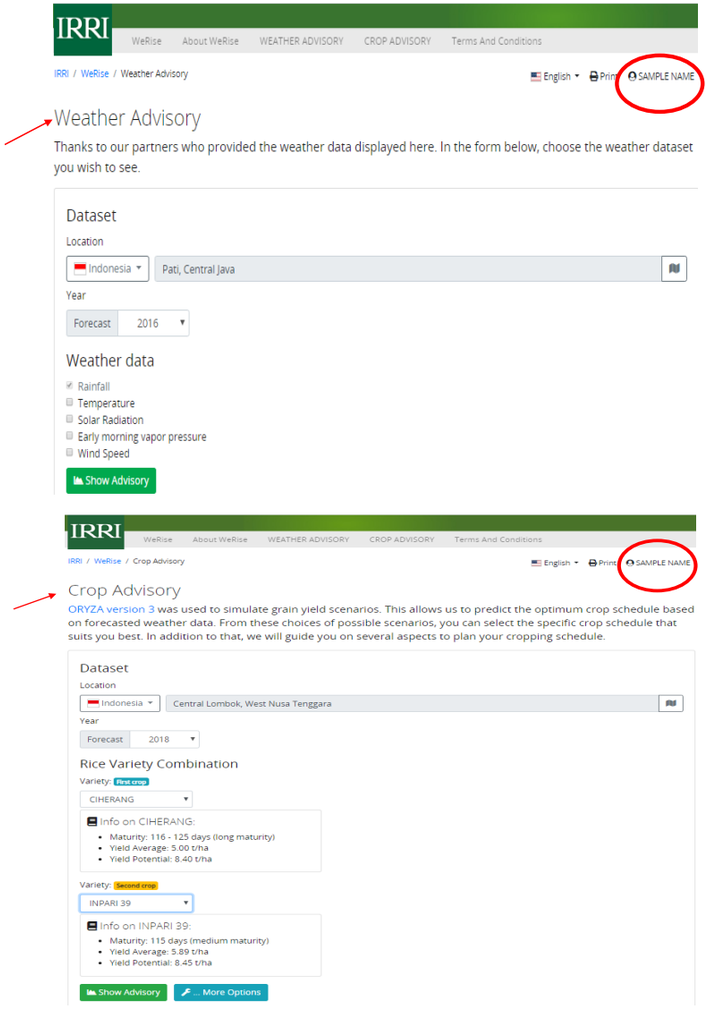


Figure 3-7. Weather and crop advisory pages upon successful WeRise account registration.

Group exercise

1. Log in to WeRise using the different methods described in this module. Click on the different menus at the menu bar. Describe what you see in the different menus: About WeRise, Weather Advisory, Crop Advisory, Terms and Conditions.

2. Register a WeRise account.

3. Once you can access the Weather advisory page, change the language and write down the first sentence you see.

4. Log out. Close the WeRise page.

5. Log in again this time using your username and password.

Module 4: Weather advisories

Learning objectives

By the end of the module, participants will be able to:

- generate weather advisories using WeRise
- interpret the contents of the weather advisories and translate them to field language
- print and save the WeRise advisories

Intended outcome

By the end of the module, participants will be confident to generate the WeRise weather advisories.

Time allocation

60 minutes

Material requirements

Table 6. Module 4: Material requirements.

Resource person	Participants
Laptop computer	Note pad
LCD projector	Ball pen
Powerpoint presentation	Copy of the exercises
	Printer
	Paper
	Laptop computer

Discussion points/Key messages

1. To generate Weather advisories: Click the Weather Advisory tab from the menu or click its icon on the Home page > Select the location and forecast year under "Data Set." > Choose the weather data you want to generate under "Weather Data." > Click "Show Advisory."

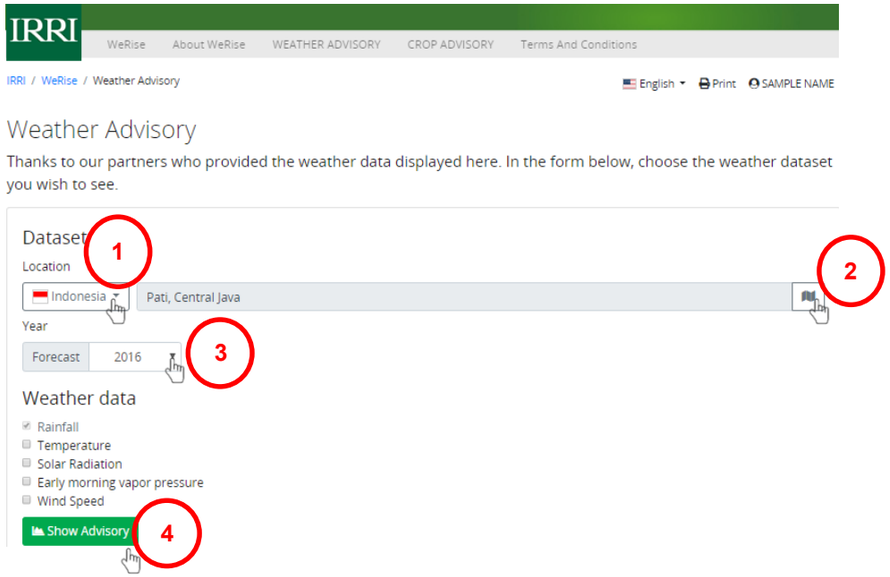


Figure 4-1. Steps in generating weather advisories.

The default parameter is rainfall. You may also generate advisories for temperature, solar radiation, early morning vapor pressure, and wind speed.

You may change the language by clicking on the drop down menu of the language icon beside the print icon on the right side before selecting data requirements under Dataset and Weather data.

2. The following outputs will appear.

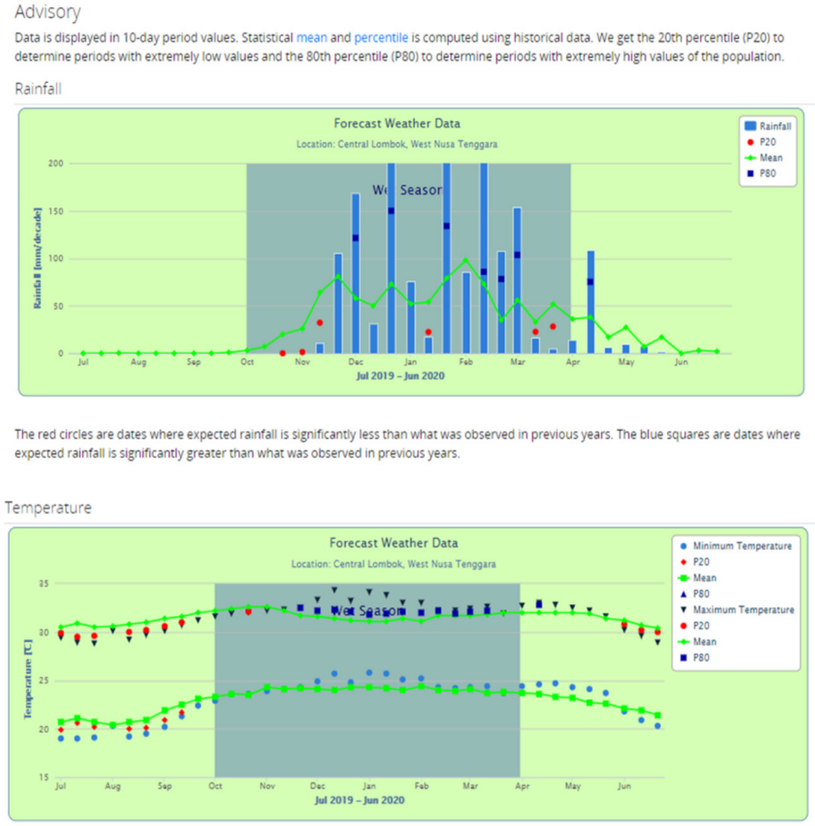


Figure 4-2. Weather advisories: outputs for rainfall and temperature.

Figure 4-3. Weather advisories: outputs for solar radiation, early morning vapor pressure and wind speed.

3. To print the Weather advisories, click the print icon beside your username and print.

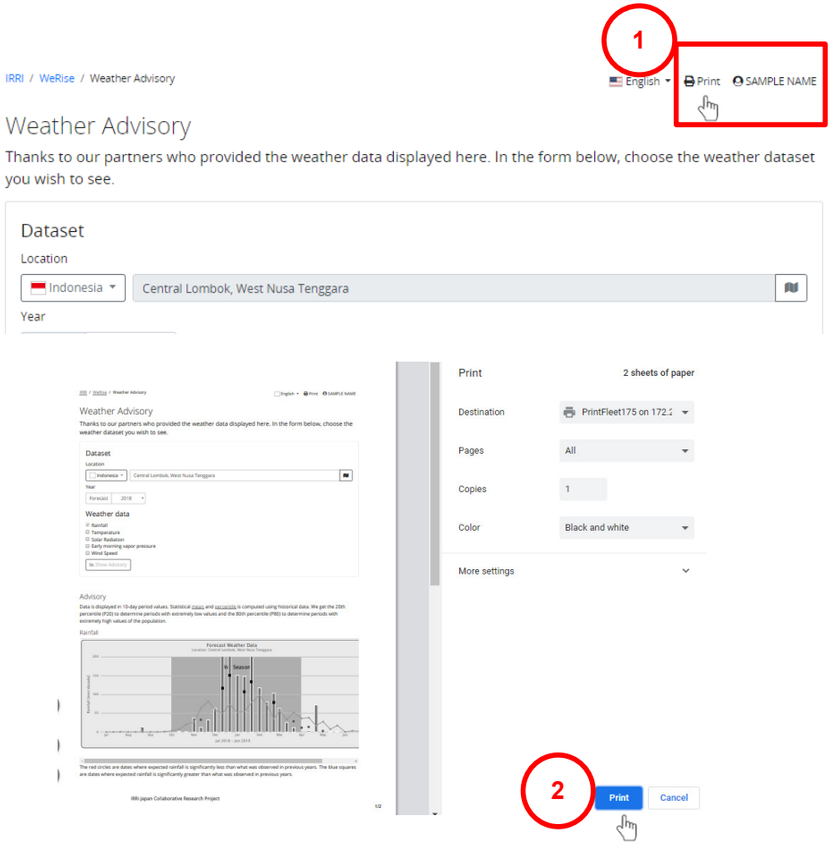


Figure 4-4. Steps to print the weather advisories.

You may also save the advisories for your records or printing at a later date.

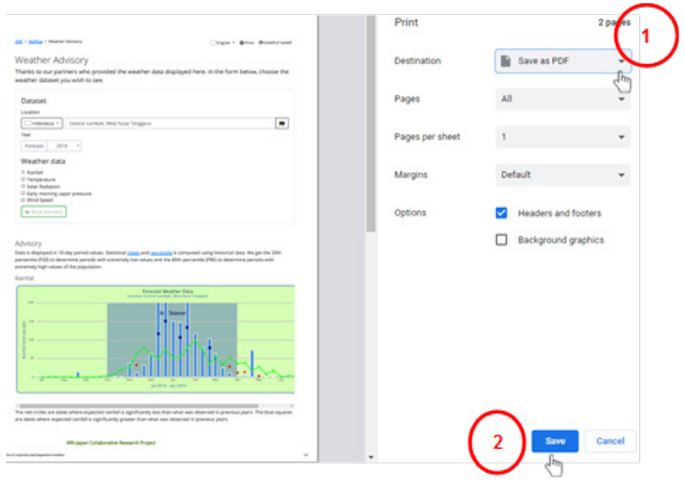


Figure 4-5. Steps to save the weather advisories.

Group Exercise

1. Generate the weather advisories for rainfall for the upcoming cropping season in your area. Do the same for the other weather parameters.

2. Save a copy of the weather advisories in your laptop.

3. Print the weather advisories.

4. For the rainfall weather advisory you have generated, identify the months where there are projected droughts and flooding.

5. Given the weather advisories, around when would it be good to sow? Why?

Module 5: Crop advisories

Learning objectives

By the end of the module, participants will be able to:

- generate crop advisories using WeRise under different scenarios
- interpret the contents of the weather advisories and translate them to field language

Intended outcomes

By the end of the module, participants will be confident to generate the WeRise crop advisories and explain them to farmers. Participants will have also gained an appreciation that WeRise can provide options for strategic crop management.

Time allocation

120 minutes

Material requirements

Table 7. Module 5: Material requirements.

Resource person	Participants
Laptop computer	Note pad
LCD projector	Ball pen
Powerpoint presentation	Copy of the exercises
	Printer
	Paper
	Laptop computer

Discussion points/Key messages

1. Click the Crop Advisory tab from the menu or click its icon on the Home page > Select the location and forecast year under "Data Set." > Select your preferred variety for the first crop and second crop under "Rice Variety Combination." > Click "Show Advisory."

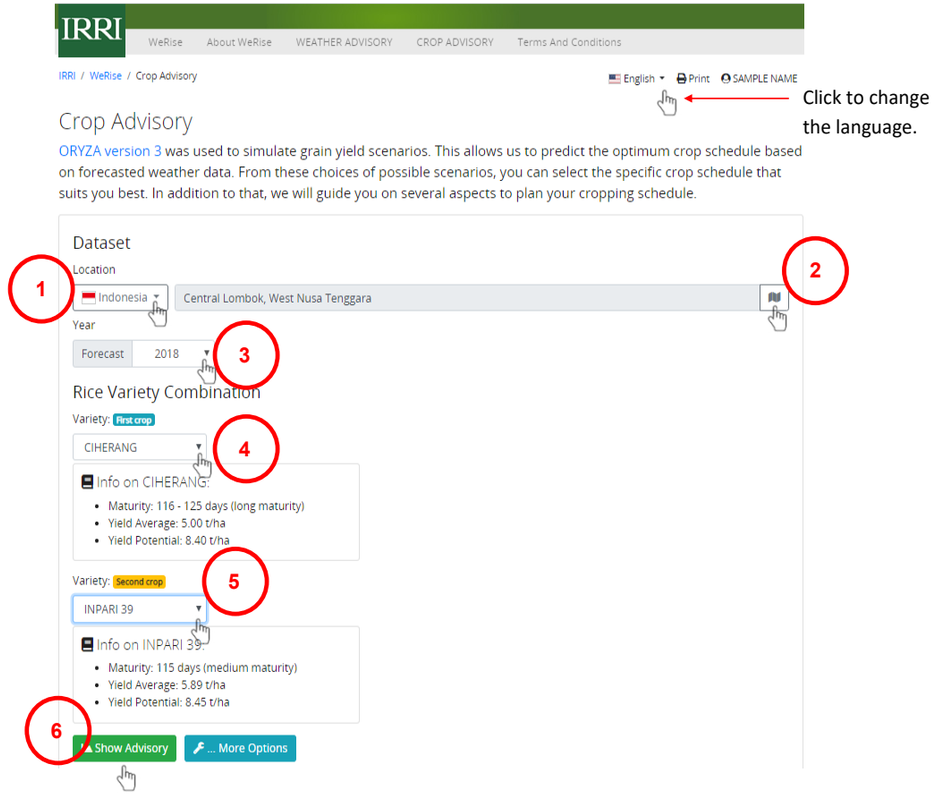


Figure 5-1. Steps in generating crop advisories.

2. If you prefer a specific sowing date, click the Crop Advisory tab from the menu or click its corresponding icon on the Home page > Select the location and forecast year under "Data Set." > Select your preferred variety for the first crop and second crop under "Rice Variety Combination" > Click "More Options." > Set your sowing dates. > Click "Show Advisory."

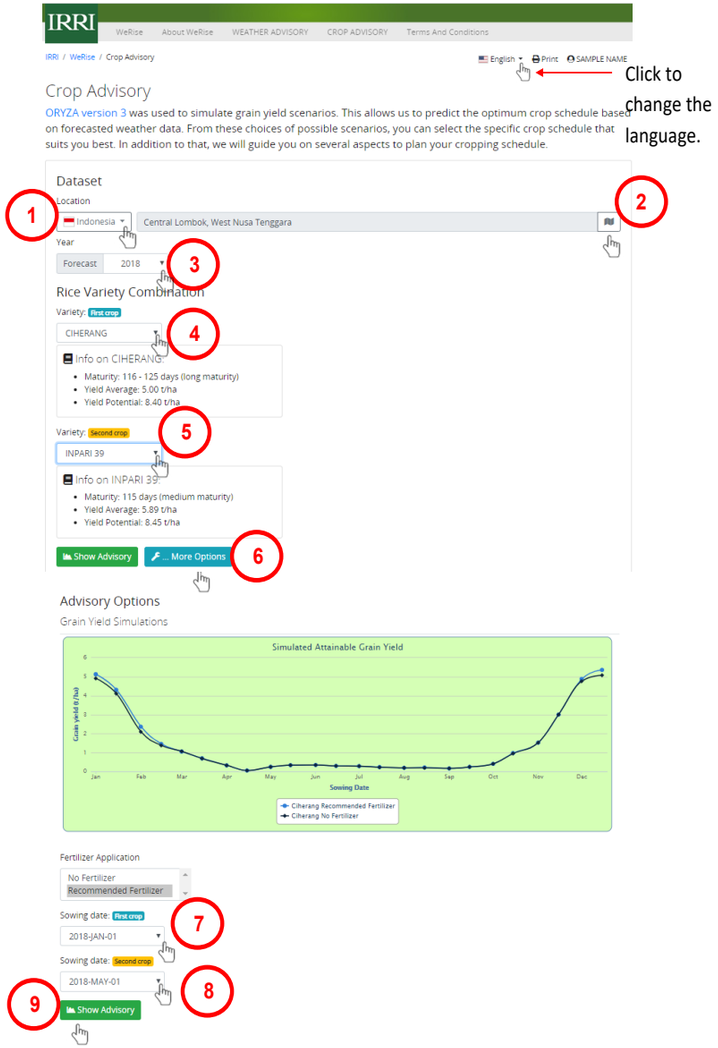
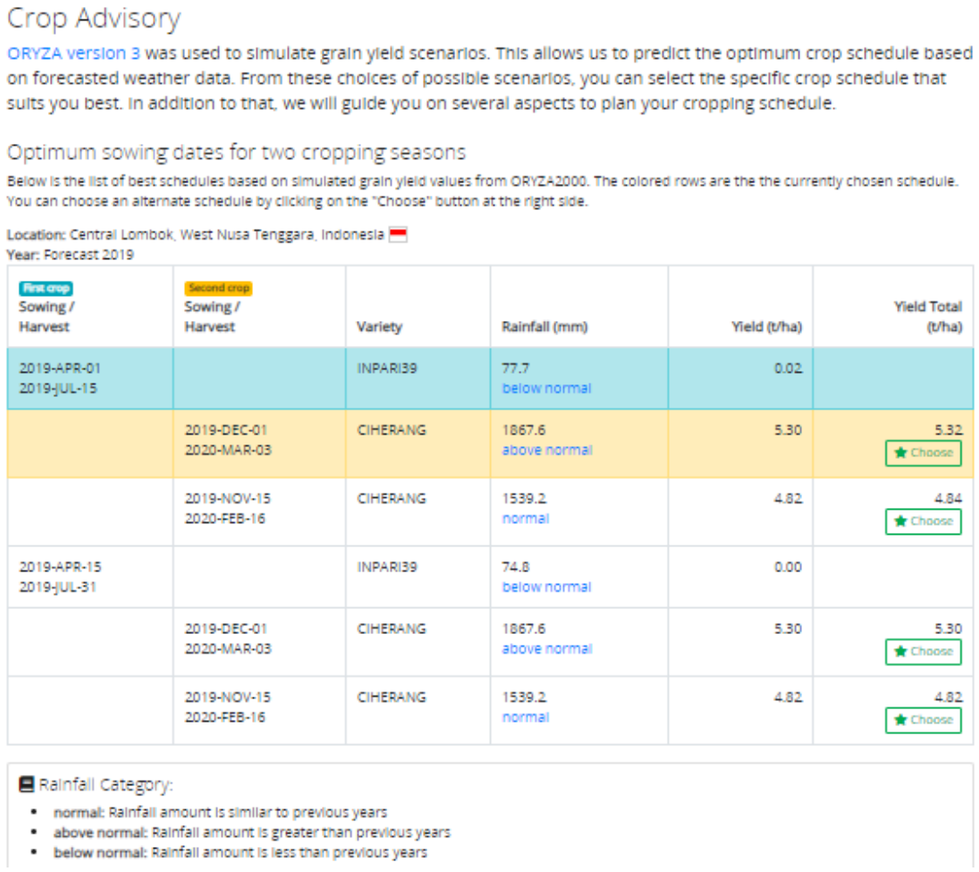


Figure 5-2. Steps in generating crop advisories if you have a preferred sowing date.

You may change the language by clicking on the drop down menu of the language icon beside the print icon on the right side before selecting data requirements under Dataset and Rice Variety Combination.

3. The following outputs will appear:



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 the currently chosen schedule. You can choose an alternate schedule by clicking on the "Choose" button at the right side.

Location: Central Lombok, West Nusa Tenggara, Indonesia
Year: Forecast 2019

First crop Sowing / Harvest	Second crop Sowing / Harvest	Variety	Rainfall (mm)	Yield (t/ha)	Yield Total (t/ha)
2019-APR-01 2019-JUL-15		INPARI39	77.7 below normal	0.02	
	2019-DEC-01 2020-MAR-03	CIHERANG	1867.6 above normal	5.30	5.32 Choose
	2019-NOV-15 2020-FEB-16	CIHERANG	1539.2 normal	4.82	4.84 Choose
2019-APR-15 2019-JUL-31		INPARI39	74.8 below normal	0.00	
	2019-DEC-01 2020-MAR-03	CIHERANG	1867.6 above normal	5.30	5.30 Choose
	2019-NOV-15 2020-FEB-16	CIHERANG	1539.2 normal	4.82	4.82 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

Figure 5-3. Crop advisories: outputs (Part 1).

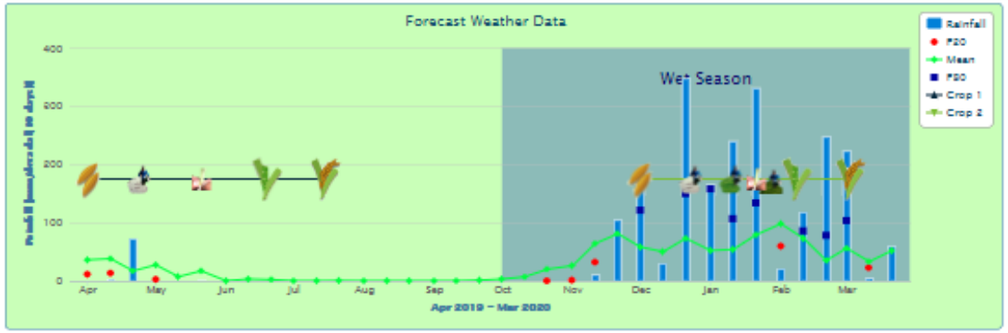
Advisory

You have chosen 2019-APR-01 as the sowing date for the first crop and 2019-DEC-01 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.

Sowing Date	Harvest Date	Fertilizer Schedule		
		Basal	Top Dress 1	Top Dress 2
First crop » **Variety:** INPARI 39 - **Yield:** 0.02 t/ha				
2019-APR-01	2019-JUL-15	APR-19 to APR-27		
Second crop » **Variety:** CIHERANG - **Yield:** 5.30 t/ha				
2019-DEC-01	2020-MAR-03	DEC-19 to DEC-27	JAN-06 to JAN-14	JAN-23 to JAN-31



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.

Figure 5-4. Crop advisories: outputs (Part 2).

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

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

10000 Rupiah

	First crop	Second crop
Crop Establishment	transplanting transplanting is usually done if sowing date is within March to June	direct dry seeding direct dry seeding is usually done if sowing date is within july to february
Rainfall	Expected rainfall is 77.7 mm. This is below normal compared to previous years.	Expected rainfall is 1867.6 mm. This is above normal compared to previous years.
Water requirement	690 mm	963 mm
Water deficit	612 mm	0 mm

Figure 5-5. Crop advisories: outputs (Part 3).

Guidelines

Schedule	Drought period (5-6 day interval)	Irrigation not needed
Amount of time needed to irrigate deficit	(85 hr/ha) X (1 ha) = 85 hr	
Fuel consumption	85 L	
Fuel cost	790,500 Rupiah	

Total Production

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)	3.50	0.37	3.87
Family consumption 1	0.20	0.20	0.40
Surplus	3.30	0.17	3.47

1 Rice consumption of one adult person for 6-month period is 67.31 kilograms. (Source: http://ricestat.irri.org:8080/wrsv3/)

Figure 5-6. Crop advisories: outputs (Part 4).

4. To see your potential surplus (computed after deducting the amount 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.

Farmer's Information

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

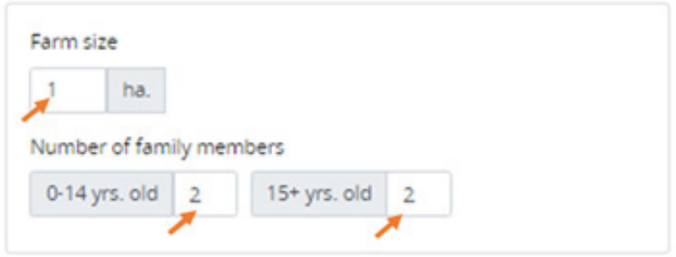


Figure 5-7. Information requirements to determine any potential surplus.

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	2.69	0.03	2.72
Family consumption 1	0.24	0.24	0.48
Surplus	2.46	-0.21	2.25

1 Rice consumption of one adult person for 6-month period is 59.75 kilograms.

Figure 5-8. Crop advisory outputs for any potential surplus after supplying the required.

5. If the farmer has supplemental irrigation, compute for the irrigation requirements by supplying the following information:

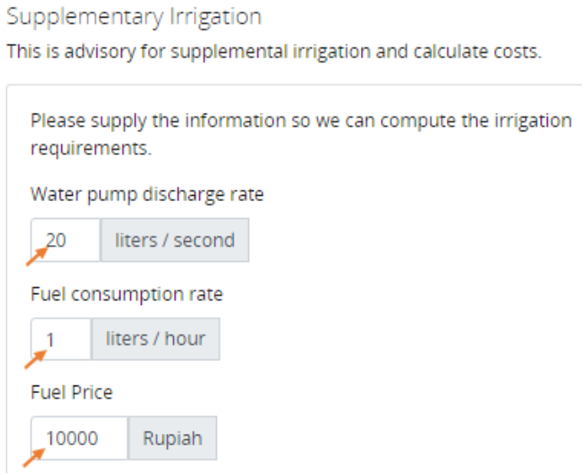


Figure 5-9. Information requirements to compute for supplemental irrigation.

The following table in the Crop Advisory will change.

Amount of time needed to irrigate deficit		(100 hr/ha) X (1 ha) = 100 hr
Fuel consumption		100 L
Fuel cost		1,001,388 Rupiah

Figure 5-10. Crop advisory output for supplemental irrigation after supplying the required information indicated in Figure 5-9.

6. To print and save the crop advisories, follow the instructions in Module 4.

Group exercises

Each group will be assigned to work on two cases and generate crop advisories. Guide questions should be answered by the group. The group will assign a representative to present the answers.

Case 1: Same varieties/WeRise recommendation both croppings

Pak Hadji wants to plant Variety X for the first and second rice crop by following the WeRise recommended sowing dates. Generate the first recommendation and the alternate recommendation.

Case 2: Different varieties/WeRise recommendation both croppings

Pak Zaini wants to plant Variety X for his first crop and Variety Y for his second crop by following the WeRise recommended sowing dates. Generate the first recommendation and the alternate recommendation.

Case 3: Same varieties/Preferred sowing date for 1st crop and WeRise recommendation for 2nd crop

Pak Hasil wants to plant Variety X for his first and second rice crop – using his preferred sowing date for the first rice crop. He will follow the recommended sowing date of WeRise for the second rice crop.

Case 4: Same varieties/Preferred sowing date for both croppings

Pak Iwan wants to plant Variety Y for the first and second rice crop using his preferred sowing dates for the first and second rice crop.

Case 5: Different varieties/ Preferred sowing date for 1st crop and WeRise recommendation for 2nd crop

Pak Agus wants to Variety X for the first crop and Variety Y for the second rice crop. He will fol-low his preferred sowing date for the first rice crop. He will follow the recommended sowing date of WeRise for the second rice crop.

Case 6: Different varieties/ Preferred sowing date for both croppings

Pak Ali wants to plant Variety X for the first crop and Variety Y for the second rice crop by following his preferred sowing date during the first and second rice crop.

Case 7: For the first and second crop: One variety using WeRise recomendation and Preferred sowing date

Pak Keiichi wants to compare the yield if he will follow the WeRise recommendation and his preferred sowing date (farmer's practice). He will plant Variety Y for the first and second crop.

Case 8: For the first and second crop: Different varieties using WeRise recommendation and Preferred sowing date

Pak Keiichi wants to compare the yield if he will follow the WeRise recommendation and his preferred sowing date (farmer's practice). He will plant Variety X for the first crop and Variety Y for the second crop.

Answer the following guide questions for the group presentation:

1. When is the best time to sow or what is your preferred sowing date? For the second best option, when does WeRise recommend to sow (if applicable to your case)?

2. What will be your predicted yield for the first crop? For the second crop? Will it be worthwhile to plant the second rice crop?

3. When will you apply fertilizer? What is the recommended frequency of fertilizer application?

4. How much is your estimated water deficit during the first and second rice crop?

5. Do you have a surplus? If yes, how much?

Module 6: Planning for communicating the WeRise advisories

Learning objectives

By the end of the module, participants will be able to develop a site-specific communication plan to deliver WeRise advisories in their respective areas and present the plan to the other participants.

Intended outcome

By the end of the module, participants will have a prepared communication plan to deliver the WeRise advisories for the upcoming cropping season to farmers in their respective jurisdictions.

Time allocation

90 minutes (60 min writeshop; 30 min presentation)

Material requirements

Table 8. Module 6: Material requirements.

Resource person	Participants
Laptop computer	Note pad
LCD projector	Ball pen
Powerpoint presentation	Copy of the exercises
Copy of the WeRise Advisories developed from the previous modules	Laptop computer
	White board/flip charts
	White board marker/pentel pen and eraser
	Copy of the WeRise Advisories developed from the previous modules

Instructions

a. Grouping

1. The participants will be grouped (e.g., For Indonesia's case, a group could be composed of extension workers from one district, its subdistrict, and its subdistrict's village, and AIAT staff and/or Provincial extension worker).

2. Each group will select its leader who will lead in the discussion and development of the communication plan, and a rapporteur to take down notes of the discussion.

3. Each group will have a facilitator to guide the group in the development of the communication plan.

4. About 60 minutes will be allotted to develop the communication plan.

b. Task

Develop a communication plan (Table 9) to communicate WeRise advisories to farmers in a particular area (e.g., district). A communication plan outlines the message the group wants to deliver and how the message will be delivered to the target recipients. The communication plan should include the following:

Table 9. The communication plan.

Group:	
Leader:	
Members:	
Facilitator:	
Message or WeRise advisories to communicate:	The message or WeRise Advisories you want to communicate.
Communication goal:	Your goal in communicating the WeRise Advisories.
Communication flow:	The pathway (from whom to whom will the flow of communication be) Note: A diagram to show communication flow should be prepared in a separate page.
How to deliver the WeRise advisories Note: This can also be presented in the diagram of the communication flow above.	The means of communication along the pathway (how the information will be communicated or delivered to target recipients)
Resources/materials:	Resources and materials needed to communicate the WeRise advisories
Responsible persons/agencies:	Persons/agencies that will be responsible for the delivery of WeRise advisories
When to communicate:	When the information should be communicated (appropriate time of communicating the WeRise advisories)
Feedback mechanism:	How to receive/address feedback to ensure the WeRise advisories are delivered and received appropriately by target clients

c. Presentation

1. The communication plan will be presented as an output of Module 6.

2. The leader of the group or any of its members can present the communication plan.

3. A flipchart, white board or powerpoint can be used during the presentation.

4. A total of 30 minutes will be allotted for all presentations.

5. Clarifications, questions or suggestions to improve the communication plan will be entertained after each presentation.

6. Copy of the communication plan will be submitted to the training organizers.

References

Colorado State University. Developing an Effective Extension Communication Plan. https://extension.colostate.edu

FAO. 1998. Improving Agricultural Extension: A Reference Manual. Burton E. Swanson

Robert P. Bentz, and Andrew J. Sofranko. Eds. Food and Agriculture Organization of the United Nation. Rome, 1997

Vignare, Karen. 2013. Options and Strategies for Information and Communication Technologies Within Agricultural Extension and Advisory Services. https://meas.illinois.edu

Group reflection

Training evaluation and WeRise user feedback survey

The training facilitator may divide the participants into groups of three or five depending on the total number.

Instructions for each group:

1. Assign a group leader. He/she will present on behalf of the team and will also serve as the moderator during the discussion.

2. Discuss the guide questions in the succeeding slides. You are given 15 minutes to discuss and prepare your group's powerpoint presentation.

3. Present for five minutes.

4. Kindly email your presentation to the organizers.

*Optional:

Take a wacky group selfie (groufie) – Before clicking, please remember to say, WeRise!

Insert a group photo in your group's powerpoint presentation.

Guide questions for each group:

What?

1. What are your major learnings from the training? What are your most favorite part of the training (topic or activity)?

2. What are your least favorite part of the training (topic or activity)?

3. What can be done to improve future trainings?

So what?

1. How did you feel …

   before the training?

   during the training?

   after the training?

2. Why do you think you felt that way?
3. Any learning insights or realizations? Why?

Now what?

1. How will you apply what you have learned from this training?
2. What are your future goals/action plan after this training?

Training evaluation and WeRise user feedback survey

See Appendices A, B and C for the forms that the training participants need to fill out individually.

Participant's notes

Appendix A. Pre-training evaluation form / Participant's information sheet

WeRise training for Agricultural Extension Workers

Instructions: Please fill out all requested information below. Check all appropriate boxes. Do NOT abbreviate. **IMPORTANT:** Do NOT leave anything unanswered. Write N/A if not applicable or NONE if none.

By accomplishing this form you, as the data subject, hereby give your consent and authorization to the processing of the personal information you have provided. Further instructions and any advance copy of training materials will be sent to the email address you will provide below.

Full Name: (As would appear in your Training Certificate)	
Job Title:	
Name of Office:	
Birthday:	Example: 12 June 1988
Email address:	
Gender:	
Educational attainment:	
Whatsapp number/Mobile number:	
Facebook (optional):	

A. Work experience

1.	How many years have you been working as an extension worker/in your current job?	
2.	In what areas do you work in (village/subdistrict)?	
3.	How many rice farmer groups are assigned to you?	
4.	How many rice farmers are members of these farmer groups?	
5.	Briefly describe your duties and responsibilities.	

B. Previous trainings attended/technology dissemination experiences

1.	Have you been involved in the dissemination of Katam?	☐ Yes ☐ No
2.	Before you learned about this WeRise training, have you heard of WeRise or known about WeRise in the past?	☐ Yes ☐ No
3.	If yes, how did you learn about WeRise?	☐ Work colleagues ☐ Seminar ☐ IRRI website ☐ Meeting ☐ Others, specify: _____ ☐ Not applicable
4.	On a scale of 1 to 10, 10 being the highest and 1 being the lowest, how would you rate your awareness/knowledge on WeRise? Put an X mark or encircle your rating. **Rating: (Little) 1 2 3 4 5 6 7 8 9 10 (Much)**	
5.	Have you attended any related-training on a decision support tool?	☐ Yes ☐ No
6.	If your answer to no. 5 is YES, please fill out the table below. If NO, write N/A on the space provided on the right.	

Table 1. Related-trainings on decision support tool.

	Title of Training	Date of Training	Organizing Agency	Venue

7.	Have you been involved in implementing a project on decision support tool or Katam, or a similar project?	☐ Yes ☐ No
8.	If your answer to no. 7 is YES, what was the project? If NO, write N/A on the space provided on the right.	
9.	If your answer to no. 7 is YES, how many years were you involved? If NO, write N/A on the space provided on the right.	
10.	If your answer to no. 7 is YES, where was your area of assignment? write N/A on the space provided on the right.	
11.	On a scale of 1 to 10, 10 being the highest and 1 being the lowest, what is your level of knowledge on the use of a decision support tool?	

Decision Support Tool	Level of Knowledge* Write N/A for not applicable.
KATAM	

Others, please specify:	
Others, please specify:	

* Level of knowledge very low (1 2 3 4 5 6 7 8 9 10) very high

C. ICT facilities at work

1.	What ICT facilities do you have in your office that you use in your job?

	ICT Facility	Available in Office (please check)		Being Used at Work (please check)		No. of Hr Used per week	Level of Competency in using the ICT facility (1-10 with 1 as lowest and 10 the highest)*
		YES	NO	YES	NO		
1.	Desktop						
2.	Laptop						
3.	Smart phone						
4.	Smart phone apps						
5.	Ipad						
6.	Printer						
7.	Fax machine						
8.	Scanner						
9.	Copier						
10.	Camera						
11.	LCD/projector						
12.	Others, please specify:						

***Rating: very low (1 2 3 4 5 6 7 8 9 10) very high**

2.	Use of social media, internet/wifi at work and rating of service :

		Available in Office? (please check)		Being Used at Work? (please check)		No. of Hr Used per week	Rating of Service* (1-10 with 1 as lowest and 10 the highest)*
		YES	NO	YES	NO		
	Internet/wifi						
	Social media:						
1.	SMS						
2.	Facebook						
3.	WhatsApp						
4.	Twitter						
5.	Instagram						
6.	YouTube						
7.	Google +						
8.	Pinterest						
9.	Tumblr						
10.	Reddit						
11.	Lainnya, sebutkan / Others, please specify:						
12.	Lainnya, sebutkan / Others, please specify:						

*** Rating: very low (1 2 3 4 5 6 7 8 9 10) very high**

3.	How would you rate your competency in using the following softwares? Choose from 1 to 10 with 1 being the lowest and 10 being the highest.

	Sofware/Program	Rating*
1.	MS Word	
2.	MS Excel	
3.	MS Powerpoint	
4.	Others, please specify:	

	Sofware/Program	Rating*
5.	Others, please specify:	

***Rating: very low (1 2 3 4 5 6 7 8 9 10) very high**

D. Language proficiency

Please indicate your English language ability whether **Fair, Good, Very Good, or Excellent**

Reading	Speaking	Writing	Listening

E. Training Expectations

1.	What are your expectations from this training?
	a.
	b.
	c.
2.	What factors do you think could ensure the attainment of your expectations?
	a.
	b.
	c.

Thank you very much!

Appendix B. Post-training Evaluation Form

WeRise Training for Agricultural Extension Workers

Training date: _____

Name: _____

This evaluation is part of our continuing effort to improve further our training. We will appreciate your objective and honest remarks/comments regarding this activity. Please check your answers and/or provide the needed information. *You may answer only those items that are applicable for this training.*

Important: Please provide ratings for all indicators and answer ALL questions.

Please rate the training in terms of the following indicators. INDICATORS	**Put a check on your rating. RATING**				
A. Training objective	**Strongly disagree**	**Disagree**	**No opinion or uncertain**	**Agree**	**Strongly agree**
	[1]	[2]	[3]	[4]	[5]
• Attainment of training objectives.					
B. Program content	**Very poor** [1]	**Poor** [2]	**Fair** [3]	**Good** [4]	**Very Good** [5]
• Provision of new information/ knowledge/skills					
C. Training Aspects					
• Usefulness/relevance of the training to your work/job.					
• Effectiveness of the resource persons in general.					
• Appropriateness of instructional methods used.					
• Time allocation of the training activity.					
• Participants involvement in all the discussions/activities.					
• Organization of the activity.					
• Coordination of the training activity.					
D. Training Management					
• Time management					
• Facilities/Venue					
• Food					
Overall rating of the training course					

Other concerns:

1. Were your expectations of the training attained? [ ] YES [ ] NO
   If yes, which of your expectations were attained?

   a. _____
   _____

   b. _____
   _____

   c. _____
   _____

If NO, which of your expectations were not attained and why?

   a. _____
   _____

   b. _____
   _____

   c. _____
   _____

2. What are the most significant learning/insights you got from the training?

   _____

3. After the training, what is the degree of your knowledge of WeRise?

   very low (1 2 3 4 5 6 7 8 9 10) very high

4. What did you appreciate the most about the training program?

   _____

5. What do you think should be improved in this training and how can they be improved?

   _____

   _____

6. Would you recommend other staff from your office to attend the same program?
   [ ] yes [ ] no

   *Why?*_____

Thank You Very Much!

Appendix C. WeRise user feedback form

Your help in completing this evaluation is appreciated. The information you provide will be useful in determining areas for improvement to make the WeRise more user-friendly.

Please check the boxes corresponding to your answers or write the answers on the space provided.

Tell us about yourself...
Name (optional): _____ Age: ___ Gender: _____

Highest education level: Country: Date of training:

Your job:
[ ] Researcher [ ] Extension worker [ ] Government official
[ ] Teacher [ ] Farmers
[ ] Others, please specify _____

Number of years in current job: _____

Do you have internet access during your working hours? [ ] Yes [ ] No

How many hours in a week do you use the internet? _____

Please rate WeRise.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. I can easily use it.					
b. I can easily understand the outputs of the WeRise.					
c. It will be easy to explain the outputs of the WeRise to farmers.					
d. WeRise can help with my work.					

Please write any additional comments you may have and suggestions to improve WeRise.

Thank you.